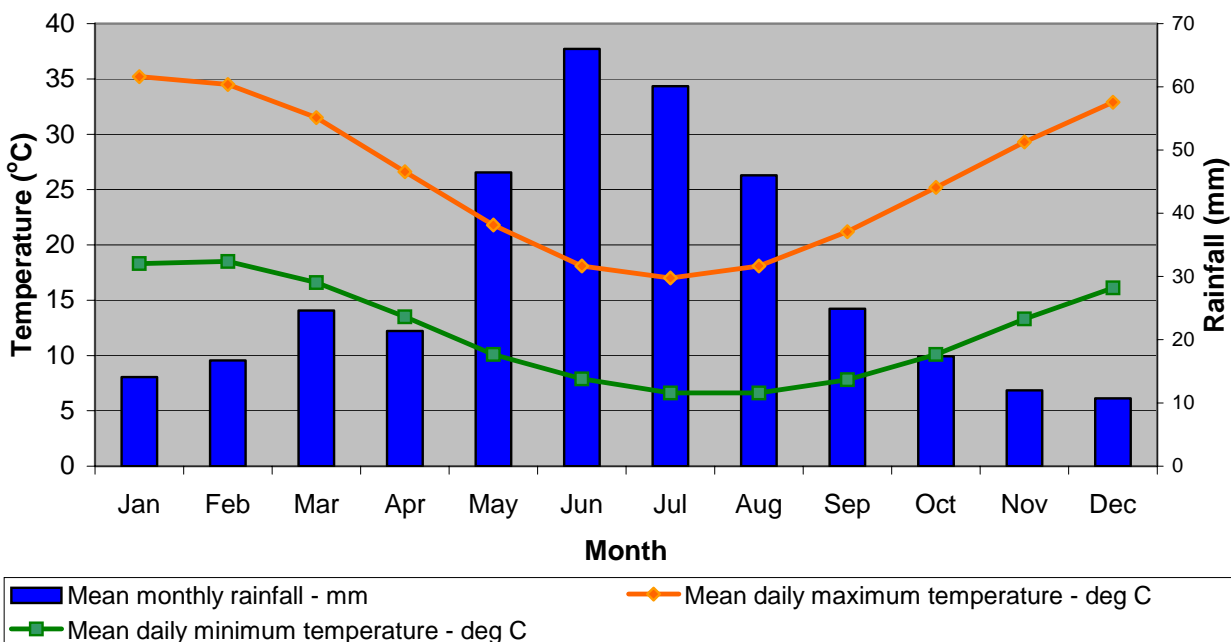


## 1.0 INTRODUCTION

The Shire of Dalwallinu is located 250 km north-east of Perth in Western Australia's northern wheatbelt region, otherwise known as the Midlands region. The Shire covers an area of 7,187 square km and supports a population of approximately 1,767 people. It is serviced by 1,939 km of roads, of which 449 km are sealed (W.A. Local Government Directory, 2003-2004). The Dalwallinu townsite is the administrative centre for the Shire; other localities include Kalannie, Wubin, Pithara and Buntine.

The area experiences a Mediterranean climate with an average annual rainfall of 360mm. Seasonal temperatures are characterised by warm summers, with maxima averaging from the high twenties, and mild winters, with maxima in the mid teens. Mean daily maximum and minimum temperatures and rainfall statistics are shown below.



**Figure 1 – Mean daily maximum and minimum temperature (°C) and rainfall (mm) in the Shire of Dalwallinu, based on climate averages from the Dalwallinu weather station 008039 (commenced 1912; Last record: 2003).**

The primary land use is agriculture, which accounts for 575,482 hectares of land or 78% of the Shire. There are 8,917 hectares of A-Class Conservation Reserves in the Shire, representing 1.24% of land area. Other local industries include bulk fertiliser services, shearing, gypsum mining, Ostrich farming and cedar blind manufacture (Shire of Dalwallinu, [www.dalwallinu.wa.gov.au/geography/landuse&.htm](http://www.dalwallinu.wa.gov.au/geography/landuse&.htm)).

82.3%, or 595,418 ha of the Shire is located within the Intensive Land-use Zone (ILZ), an area dominated by intensive agricultural enterprises such as cropping and grazing

with some horticulture, intensive livestock production and resource protection. The remaining 17.7% (128, 263 ha) of the Shire is located within the Extensive Land-use Zone (ELZ), which is dominated by grazing and mining activities (Shepherd, Beeston & Hopkins, 2001). These zones are illustrated in Figure 2.

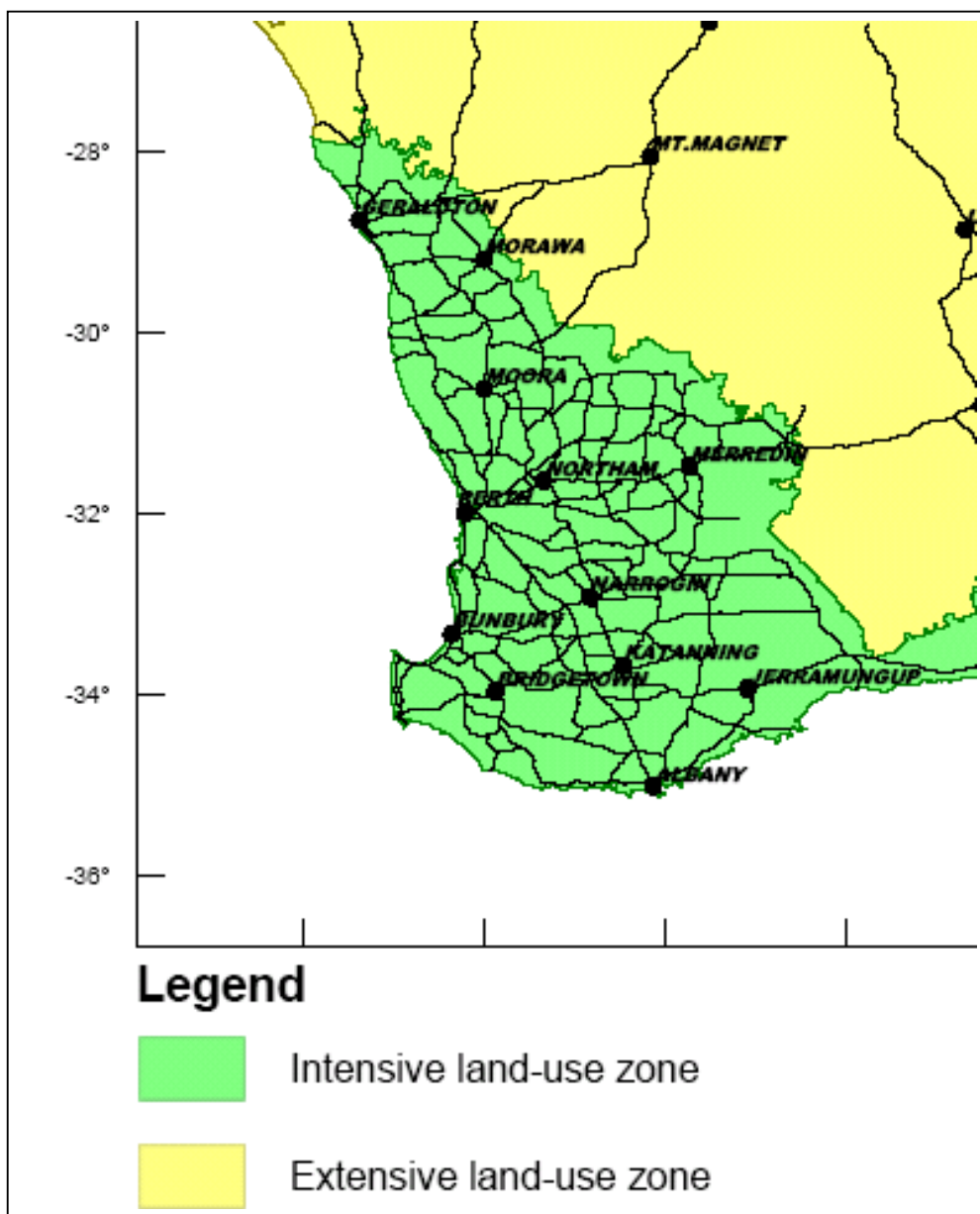


Figure 2- Land-use zones in Western Australia (Department of Agriculture WA, 2004).

Tourism plays an important role with the area's spectacular natural resources being a major attraction. Dalwallinu is the first town on *The Wildflower Way*, a well-known Western Australian tourist route which stretches north to Mullewa. The prime season for wildflowers is between July and October. Each year thousands of wildflower enthusiasts and nature lovers make the journey to enjoy the rare and beautiful sight of flowers literally carpeting the countryside. Other salient features of the area include the Old Courthouse Tourist Information Centre, Wubin Wheatbelt Museum, The Old Well and Petrudor Rock.

## 1.1 Flora and Fauna

Based on WA Herbarium records, over 900 species of plants have been recorded from the Shire of Dalwallinu. These include 108 species of Acacia, 48 species of Eucalypt, 48 species of Grevillea, 34 species of Melaleuca, 20 species of Eremophila and 23 species of Verticordia, see Appendix 4.

The unique flora seen in the remnant bushland on roadsides rival horticultural varieties of exotic origin and require less water and fertiliser. They have evolved to cope with the low nutrient status of the Western Australia soils and a low annual rainfall with long dry summers.



**The Painted Featherflower (*Verticordia picta*) can be seen flowering in Dalwallinu between July and November.**

Photography by A. Carr, M. Hancock, M. Seale & S. D. Hopper. Photo used with the permission of the WA Herbarium, CALM (<http://florabase.calm.wa.gov.au/help/photos#reuse>).

Threatened and priority fauna observed in the Shire of Dalwallinu, based on information from the Department of Conservation and Land Management, indicates that ??? species have been recorded or sighted throughout the Shire,

## 1.2 Remnant Vegetation Cover

Within the Intensive Land-use Zone (see Figure 2), the Shire of Dalwallinu retains 12% of its original native vegetation cover. These remnants are located in a variety of tenures, from nature and crown reserves to privately owned bushland. Flora and fauna living in these isolated remnants require connectivity throughout the landscape to find nesting sites, food, shelter and to breed. As a consequence, the presence of native vegetation in transport corridors is of vital importance. The presence of bush corridors to connect these areas is paramount to the survival of our native flora and fauna. A comparison of remnant vegetation in Dalwallinu and with surrounding Shires can be seen in Table 1.

<b>Shire</b>	<b>Percentage of Vegetation Cover Remaining</b>	<b>Area (Ha) of Vegetation Cover Remaining</b>
Dalwallinu	12.0%	71,228
Mukinbudin	14.0%	39,021
Westonia	21.5%	57,813
Kellerberrin	7.4%	14,214
Trayning	8.4%	13,811
Merredin	11.8%	38,551

**Table 1. Remnant vegetation remaining in the Shire of Dalwallinu and surrounding Shires (Shepherd *et al* 2001).**

**Note:** Does not account for areas of these Shires occurring within the Extensive Land-use Zone (ELZ), i.e. pastoral areas of these Shires.

National Objectives and Targets for Biodiversity Conservation 2001-2005 (Environment Australia, 2001) stated that vegetation associations represented by less than 30% remnant vegetation cover are considered ecologically endangered and in need of protection and restoration wherever they are located. There are 9 vegetation associations below the 30% target of vegetation coverage and 2 with less than 10% remaining in the Shire of Dalwallinu, see Table 2. National targets for biodiversity conservation (2001-2005) state the need to have protection measures in place for those vegetation associations that are below 30%. Vegetation associations with less than 10% are considered endangered whilst those between 10-30% are considered vulnerable and those between 30-50% are considered depleted (of the pre 1750 extent).

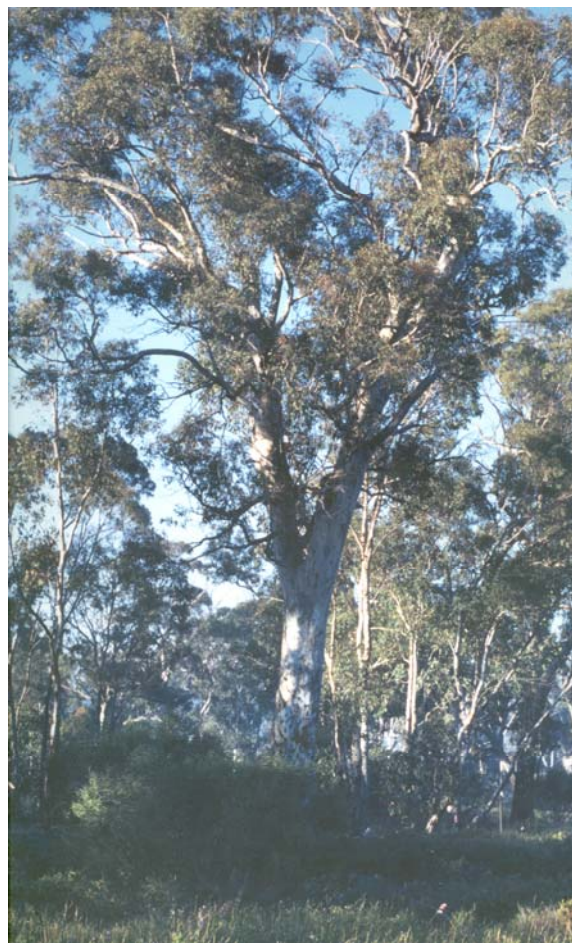
## 2.0 VALUES OF ROADSIDES

Since the settlement of Western Australia by Europeans, large areas of native vegetation in the south west of the state have been cleared for agriculture, roads, settlements, and other development. The fragmentation of the more or less continuous expanse of native vegetation communities by clearing has resulted in the isolation of plant and animal populations which have become severely disadvantaged by becoming isolated within a mosaic of man-made biogeographical islands of small native vegetation remnants. These are typically unreliable for sustaining wildlife due to food shortages, disease and reduced genetic diversity caused by a diminishing gene pool. Nevertheless, the presence of native vegetation along roadsides can often assist in alleviating this isolation effect by providing connectivity between bush remnants, thereby facilitating the movement of biota across the landscape.

Remnant vegetation includes more than just trees, comprising a diverse mix of trees, shrubs and ground covers (creepers, grasses and herbs) which when intact provide valuable food and shelter for local biodiversity. Existing native vegetation generally requires less maintenance if left undisturbed.

Remnants in transport corridors are also valuable because they:

- are often the only remaining example of original vegetation within extensively cleared areas;
- are easier to maintain and generally less fire prone than introduced vegetation;
- provide habitat for many native species of plants, mammals, reptiles, amphibians and invertebrates;
- provide wildlife corridors linking other areas of native vegetation;
- often contain rare and endangered plants and animals. Currently, roadside plants represent more than 80 per cent of the known populations of 40 of the declared rare species, and three of these are known only to exist in roadside populations;
- provide the basis for our important wildflower



**Mature Wandoo are important habitat trees.**

Photo by B. M. Hussey



tourism industry. The aesthetic appeal of well-maintained roadsides should not be overlooked, and they have the potential to improve local tourism and provide a sense of place;

- often contain sites of historic or cultural significance;
- provide windbreaks and stock shelter areas for adjoining farmland by helping to stabilise temperature and reduce evaporation.
- assist with erosion and salinity control, and not only in the land adjoining the road reserve per se;
- are generally far less of a fire threat than annual weeds;
- provide a benchmark for the study of soil change throughout the advancement of agriculture;
- provide a valuable source of seed for regeneration projects. This is especially pertinent to shrub species, as clearing and grazing beneath farm trees often removes this layer;

**Approval of the local shire and a CALM permit are required prior to collection.**

In a time of rapid change, where the demands placed on the natural resources are numerous, it is vital that there is a coordinated management of lands across all tenures and boundaries to ensure the sustainability and integrity of the natural biota ecosystem processes, agricultural lands and service infrastructure.



***Roadsides are the vital link . . . and a priceless community asset.***

### 3.0 LEGISLATION

Uncertainty often exists in the minds of many with regard to the 'ownership', control and management of 'the roadside'. This problem is also exacerbated by the multitude of legislative reference to activities within a transport corridor.

The Department of Conservation and Land Management (CALM) has the legislative responsibility to manage and protect all native flora and fauna in Western Australia. It is important to note that all flora and fauna is protected under provisions of the *Wildlife Conservation Act* 1950 and cannot be taken unless it is taken in a lawful manner. In addition to the general provisions relating to protected flora under the *Wildlife Conservation Act*, special protection is afforded to flora that is declared as rare or threatened under section 23F of the *Wildlife Conservation Act*.

The legislation pertaining to the management of road reserves is complex and includes those listed below.

State legislation:

- *Aboriginal Heritage Act* 1972
- *Agriculture and Related Resources Protection Act* 1976
- *Bush Fires Act* 1954
- *Conservation and Land Management Act* 1984
- *Environmental Protection Act* 1986
- *Heritage of WA Act* 1990
- *Land Act* 1933
- *Local Government Act* 1995
- *Main Roads Act* 1930
- *Mining Act* 1978
- *Soil and Land Conservation Act* 1945
- *State Energy Commission Supply Act* 1979
- *Water Authority Act* 1987
- *Wildlife Conservation Act* 1950-1979

Commonwealth legislation:

- *Environment Protection and Biodiversity Conservation Act* 1999

It is recommended that a cautionary approach be taken when working within roadsides, and that the relevant authority be contacted if there is any doubt about the management or protection of heritage or conservation values present in the roadsides.

The Environmental Protection Amendment Act 2003, proclaimed by parliament on the **18<sup>th</sup> November 2003**, will require greater adherence to legislative requirements before native vegetation is cleared. This legislation will provide for two types of permits which will provide for permission to clear native vegetation, however they will have certain conditions attached to them. For example, the road managing authority may be required to prepare, implement and adhere to a roadside or specific tenure management plan. Before any native vegetation is cleared it is incumbent on the project manager or land manager to ensure that the proposed clearing is being carried out under the terms and conditions of the pending legislation, as there are transitional provisions within it, which are retrospective from 26<sup>th</sup> June 2002.



## 4.0 ROADSIDE CONSERVATION IN THE SHIRE OF DALWALLINU

### 4.1 Collection of native plant material from roadsides

The Shire of Dalwallinu does not generally allow the collection of wildflowers or seed from native plants within road reserves. Exceptions may be granted for special cases, and for particular species. The council has no policy on this issue but has given permission to the Environment Society to collect seed for revegetation purposes. Under the *Wildlife Conservation Act* the Department of Conservation and Land Management may issue a licence following Shire approval.

Collecting seed from a roadside may be the only option in cases where there are no other sources of seed for revegetation, although, it has the potential to impact negatively on the roadside flora. Collection of native plant material from roadsides:

- further depletes the already scarce resource,
- can detract from the integrity of the roadside,
- reduces the amount of seed available for natural regeneration,
- reduces the ability of the area to regenerate after disturbances such as fire, and
- threatens roadside plant communities with the potential introduction and spread of two major threats – *Phytophthora* dieback and weeds.

### 4.2 Declared Rare Flora (DRF)

Declared Rare Flora (DRF) refers to species, or populations of native plants that are of great significance and should be treated with special care when road and utility service, construction or maintenance is undertaken. Populations of DRF along roadsides are designated Special Environmental Areas (SEA's) and are marked out by yellow stakes with an identification plate welded on. See figures 12 and 13.

It is the responsibility of the road manager to ensure these markers are installed, and guides for this are outlined in 'Guidelines for Managing SEA's in transport corridors', available from the Roadside Conservation Committee.

The DRF sites register in the Shire of Dalwallinu needs to be checked for the presence of appropriate markers, and the location be made known to all involved in the management and planning of works within the roadside environment.

For more information regarding DRF it is advisable to contact the Flora Officer for the Merredin District (08) 9041 2488. If roadworks are to be carried out near DRF sites, or the yellow stakes have been disturbed, it is advisable to contact CALM at least one week in advance.

As of November 2003, the Shire of Dalwallinu had 17 populations of DRF species on roadsides, with 14 of these sites vested in the Shire. Species of DRF recorded from the Shire of Dalwallinu include:

- *Daviesia dielsii*
- *Pityrodia axillaris*
- *Grevillea pythara*
- *Eremophila pinnatifida*
- *Grevillea bracteosa*
- *Boronia ericifolia*
- *Caladenia drakeoides*
- *Eremophila sargentii*



*Daviesia dielsii*

Photos: S.D. Hopper & A. Doley

Photography by S. D. Hopper & A. Doley. Photo used with the permission of the #reuse



*Pityrodia axillaris*

Photos: S.J.

Native Foxglove is a Priority One species  
Photography by S. J. Patrick & B. A. Fuhrer. Photo used with permission of the WA Herbarium, CALM  
(<http://florabase.calm.wa.gov.au/help/photos#reuse>)



*Grevillea pythara*

Photos: S. Patrick

Declared Rare

### 4.3 High Conservation Value Roadsides as Flora Roads

A flora road is one which has special conservation value because of the vegetation contained within the road reserve. The managing authority may decide to declare a Flora Road based on the results of the survey of roadside conservation value. Roadsides determined as having high conservation value in the Shire of Dalwallinu include:



- **ROADS**

(Not a complete list, consult the 2004 Roadside Conservation Value Map)

These, and other roads may be investigated further to see if they warrant a declaration as a Flora Road. This has a twofold effect of drawing the attention of tourists to the high conservation value roadside and it also alerts all that work in the roadside environment that the marked section of roadside requires due care to protect the values present.

In order to plan roadworks so that important areas of roadside vegetation are not disturbed, road managers should know of these areas. It is suggested that the Shire establish a *Register of Roads Important for Conservation* (see section 7.4).



#### Tourism

Attractive roadside drives are an important drawcard in this, the "Wildflower State".

Declared Flora Roads will, by their very nature, be attractive to tourists and would often be suitable as part of a tourist drive network.

Consideration should be given to:

- Promoting the road by means of a small brochure or booklet,
- Showing all Flora Roads on a map of the region or State,
- Using specially designed signs to delineate the Flora Road section (contact the RCC).



**Roadsides are one of the most accessible places for tourists to view wildflowers.**

## Management

Management objectives should involve disturbing the roadside flora as little as possible, consistent with the provision of a safe and efficient roadway. The management of Flora Roads should aim to:

- Minimise disturbance,
- Control weeds,
- Encourage natural regeneration.

The management techniques referred to in Section 7.0 of this report can be employed to minimise disturbance to roadside vegetation. Most importantly, staff should be instructed and supervised so that incremental widening does not occur at every pass of the grader.

Environmental assessments (pre-construction check-lists) should be completed prior to any upgrading work, to assist with planning for flora preservation. Fire management should be undertaken in such a way so as to take into account the ecological needs of the flora. Where rehabilitation is contemplated, local native species should always be used.



#### 4.4 Weeds

Weeds are plants that are growing outside their natural range and competing with native plants for nutrients, space, water and light. Weeds often invade roadsides and interfere with the growth and survival of native plants. The effect of weed infestations on native plant populations is severe, and causes flow on effects for native fauna. Once native plants begin to diminish, due to heavy competition, native fauna suffers due to reduced availability of habitat and food. Once weeds become established in an area, they become a long-term management issue, costing many dollars to control or eradicate. The WA Herbarium records **????** weed species in the Shire of Dalwallinu, see Appendix 4.

The Shire of Dalwallinu works with the Department of Agriculture to control some weed species, for example there is a weed eradication program targeting Saffron Thistle (*Carthamus lanatus*) within road reserves. Saffron thistle is controlled using a mixture of Round-up and Simazene. Unfortunately, roadside areas that have been sprayed may suffer from re-infestations, particularly where there has been little or no weed control carried out in adjoining lands.

A low level of weed growth, due to unfavourable weather has meant that the Shire has not sprayed weeds within roadsides for two years. With the more favourable weather in 2003 weed populations have subsequently been more competitive and invasive therefore, the weed eradication program will restart in 2004. The Shire will be targeting African lovegrass (*Eragrostis curvula*), an invasive roadside weed. African lovegrass tends to grow on the edge of the bitumen, and slowly breaks it up by root penetration. This becomes problematic when attempting to grade the shoulders, as it is difficult to remove without also damaging the bitumen.



**Roadside infestation of African lovegrass**  
(Photo by P. Hussey)

The Roadside Conservation Value map and weed overlays will assist the Shire in coordinating strategic weed control projects, with the highest priority to protect and preserve the high conservation value roadsides, and working towards rehabilitating those with a lower conservation value.



Throughout the roadside survey, six weed species were recorded, and their locations mapped. Roadside weed populations of Paterson's Curse, Wild Oats, Capeweed, Wild Radish, Wild Turnip and Rye Grass can be observed in the weed overlays provided with the Roadside Conservation Value map (2004). **Figure 11** also provides some indication of the number of kilometres of roadside that each weed was observed along.



**Paterson's Curse; *Echium plantagineum***

Photo by R. Knox and J. Dodd



**Wild Oats *Avena fatua***

Photo by J.D. Dodd

#### 4.5 *Phytophthora* Dieback

The *Phytophthora* species dieback is made up of several types of introduced fungi. About one third of native plants in Western Australia's south-west are susceptible, including species of Banksia, Hakea, Eucalyptus, Melaleuca, Verticordia, Acacia and Grevillea.

The *Phytophthora* fungus infects the roots and inhibits the uptake of water and nutrients, eventually causing death. It is more widespread and severe in the higher rainfall zone and waterlogged sites. The Shire of Dalwallinu is not a known *Phytophthora* dieback risk area as it has an annual rainfall of less than 600mm.

*Phytophthora* spreads by the movement of spores in water, or by the spread of infected soil. The spores can be introduced to uninfected areas by human activities, particularly through the soil carried on vehicle tyres or footwear.

Human activities, such as routine maintenance or construction, have the potential to spread *Phytophthora* fungi. Currently, there is no practical method of eradicating *Phytophthora* once it is established in an area.



#### **Impact of *Phytophthora* Dieback**

Photo Dieback Working Group

The Dieback Working Group has published a booklet, *Managing Phytophthora Dieback in Bushland: A guide for Landholders and Community Conservation Groups* (2000), that provides detailed information on minimising the risk of introducing or spreading *Phytophthora*.

## 5.0 ASSESSMENT PROCESS

### 5.1 Methods

The methods to assess and calculate the conservation value of the roadside reserves are described in *Assessing Roadsides: A guide for Rating Conservation Value* (Jackson, 2002). The process involves scoring a set of pre-selected attributes, which, when combined, represent a roadside's conservation status. A list of these attributes is presented on a standard survey sheet, see Appendix 2. This provides both a convenient and uniform method of scoring.

Ideally, the survey is undertaken by a group of local volunteers, who, aided by their knowledge of the area, are able to provide an accurate and cost effective method of data collection. Community participation also ensures a sense of ownership of the end product, which increases the likelihood of its acceptance and use by the local community and road managers (Lamont and Blyth, 1995).

The majority (476.2 km) of the Shire of Dalwallinu's 1,939 km of roadsides were assessed for their conservation status and mapped. Fieldwork was carried out throughout November 2003.

The enthusiastic efforts of the volunteer surveyors, local coordinator Christine Jones and the support provided by Council ensured that this project was successfully completed.

### 5.2 Quantifying Conservation Values

The following attributes were used to produce a quantitative measure of conservation value:

- native vegetation on roadside;
- extent of native vegetation along roadside;
- number of native species;
- weed infestation;
- value as a biological corridor; and
- predominant adjoining land use.

Each of these attributes was given a score ranging from 0 to 2 points. Their combined scores provided a conservation score ranging from 0 to 12. The conservation values, in the form of conservation status categories, are represented by the following colour codes

Conservation Value	Conservation Status	Colour Code
9 – 12	High	Dark Green
7 – 8	Medium High	Light Green
5 – 6	Medium Low	Dark Yellow
0 – 4	Low	Light Yellow

**Table 3: Colour codes used to depict the conservation status of roadsides.**

The following attributes were also noted but did not contribute to the conservation value score:

- width of road reserve;
- width of vegetated roadside;
- presence of utilities/disturbances;
- dominant native species;
- dominant weed species;
- fauna observed;
- general comments.

It is felt that the recording of these attributes will provide a community database that would provide information useful in many spheres, such as local government and community interest groups.

### **5.3 Mapping Conservation Values**

A computer generated map (using a Geographic Information System, or GIS), depicting the conservation status of the roadside vegetation and the width of the road reserves within the Shire of Dalwallinu was produced at a scale of **1:100,000**. The data used to produce both the map and the following figures and tables are presented in Appendix 3.

Data obtained from the Department of Conservation and Land Management, Main Roads WA and the Department of Agriculture was used in the base map, and depicts the location of remnant vegetation on both the Crown estate and privately owned land.

The roadside conservation values map initially provides an inventory of the *status quo* of the condition of the roadside vegetation. This is important as the quality of roadside vegetation has far reaching implications for sustaining biodiversity, tourism and Landcare values.

Moreover the data and map can be incorporated as a management and planning tool for managing the roadsides *per se*, as it enables the condition of roadside vegetation to be easily assessed. This information can then be used to identify environmentally sensitive areas, high conservation roadsides or strategically important areas, and thus ensure



their conservation. Conversely, it enables degraded areas to be identified as areas important for strategic rehabilitation or in need of specific management techniques and weed control programs.

The map can also be used as a reference to overlay transparencies of other information relevant to roadside conservation. This enables the roadside vegetation to be assessed in the context of its importance to the shire's overall conservation network. Other overlays, such as the degree of weed infestation, or the location of environmentally sensitive areas or future planned developments, could also be produced as an aid to roadside management.



### **Weed control along a roadside**

Photo MRWA

As well as providing a road reserve planning and management tool, the roadside conservation value map can also be used for:

- Regional or district fire management plans;
- Tourist routes, i.e. roads depicted as high conservation value would provide visitors to the district with an insight to the flora of the district;
- Landcare and/or Bushcare projects would be able to incorporate the information from this survey into 'whole of' landscape projects.



**The survey data and map can be used in developing regional or district fire management plans**

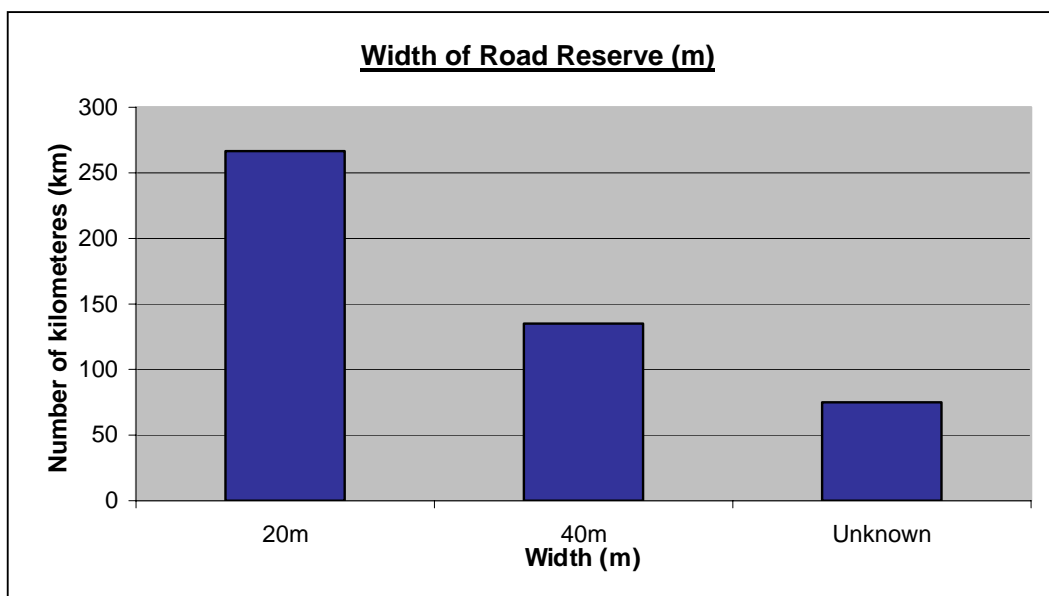


## 6.0 SURVEY DATA RESULTS

A summary of the general roadside conditions in the Shire of Dalwallinu is presented in Table 4. The survey data has been combined to provide the total kilometres, and percentages, of roadside occupied by each of the conservation status categories and the attributes used to calculate the conservation values. As roadsides occur on both sides of the road, roadside distances (km) are equal to *twice* the actual distance of road travelled.

**Table 4: Summary of the roadside conditions in the Shire of Dalwallinu.**

The 'width of road reserve' attribute indicates the total width of the road reserve, including the road formation, drains and the roadsides, i.e. from 'fence to fence'. Of the 952.5km of roads surveyed in 2003, the width of 75kms (15.7%) of road reserve was



unknown, which is common when a road passes through unfenced land, such as Nature reserves. Approximately 28% (134.9km) of the roads surveyed measured 40m in width, and 55.9% (266.4km) were 20m in width.

**Figure 2- Width of Road Reserves in the Shire of Dalwallinu (2003)**

The 'width of vegetated roadside' value provides an insight into the width of the vegetation occurring within roadsides in the Shire of Dalwallinu. Roadsides where the vegetation width was greater than 20m covered 0.77% (7.4km) of the Shire. 22.8% (217.3km) of roadsides supported vegetation between 5-20m in width, and 70.7% (673.8km) of roadsides contained native vegetation between 1-5m in width. The width of vegetation was unknown for 5.7% (54.1km), which is common when a road passes through unfenced land, such as Nature reserves.

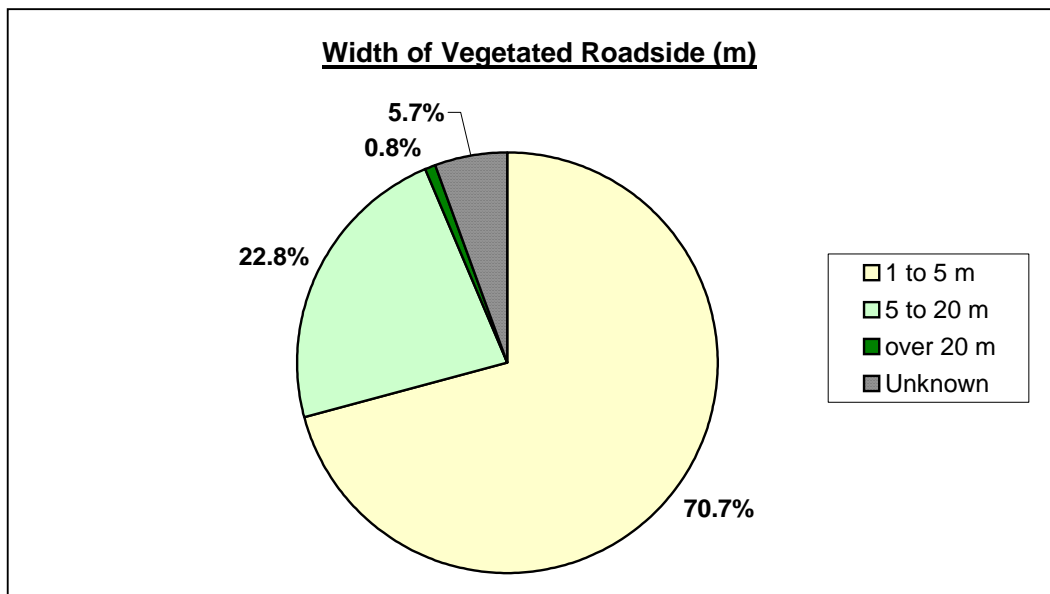


Figure 3- Width of vegetated roadsides in the Shire of Dalwallinu.

Roadside sections of high conservation value covered 65.1% of the length of roadsides surveyed (619.9 km). Medium-high conservation value roadsides accounted for 23.3% of the total surveyed (221.5 km), medium-low conservation roadside covered 5.9% of the total surveyed (55.9 km). Areas of low conservation value occupied 5.8% of the roadsides surveyed (55.2 km), Table 4, Figure 4.

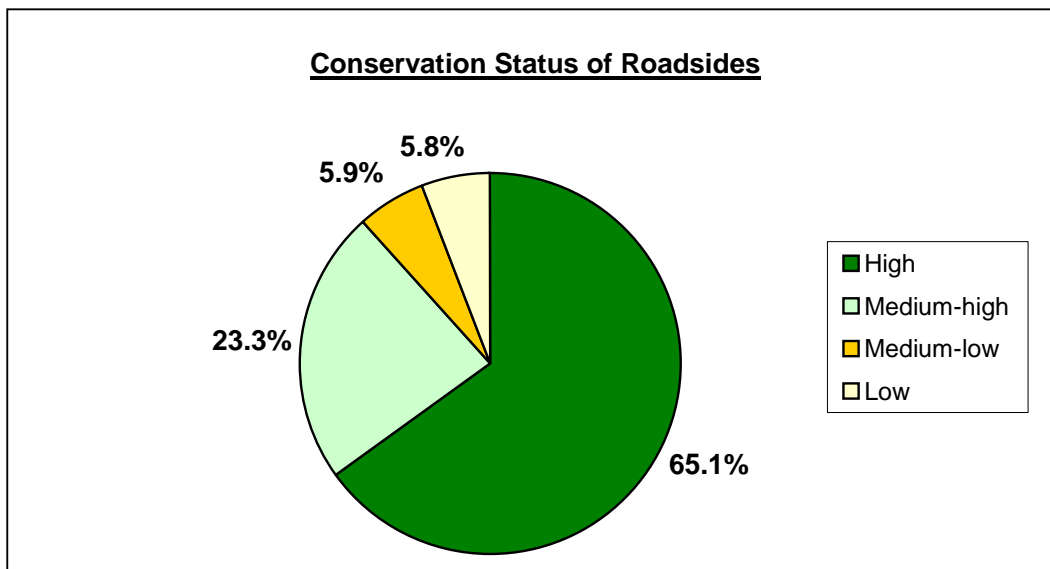


Figure 4 – Conservation status of roadsides in the Shire of Dalwallinu.

The number of native vegetation layers present, either the tree, shrub or ground layers determines the 'native vegetation on roadside' value. Sections with two to three layers of native vegetation covered 94.3% of the roadside (898.0 km). 5.5% had only one layer (52.3 km) and 0.2% had no layers of native vegetation (2.2 km), Table 4, Figure 5.

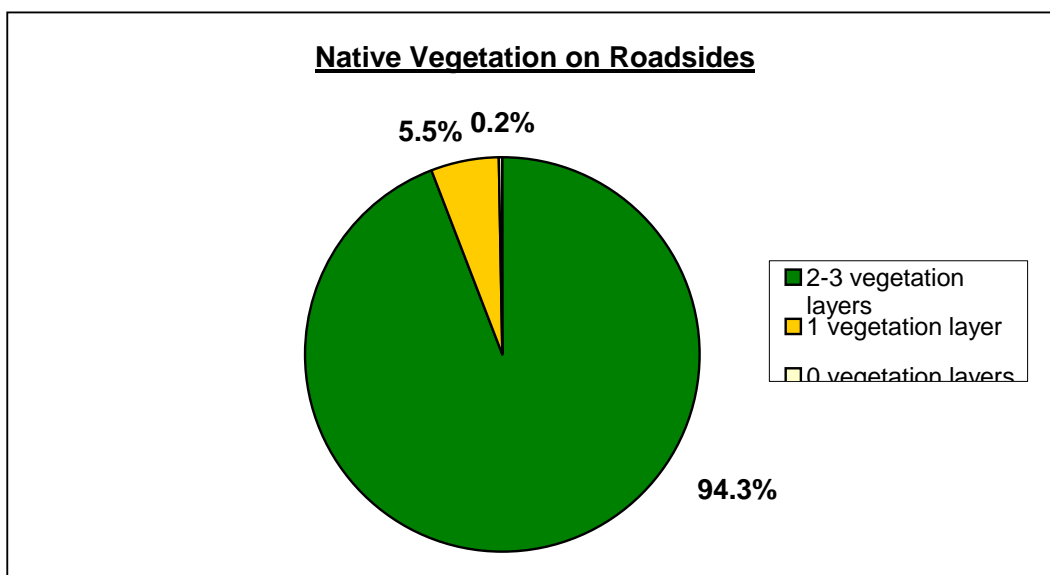
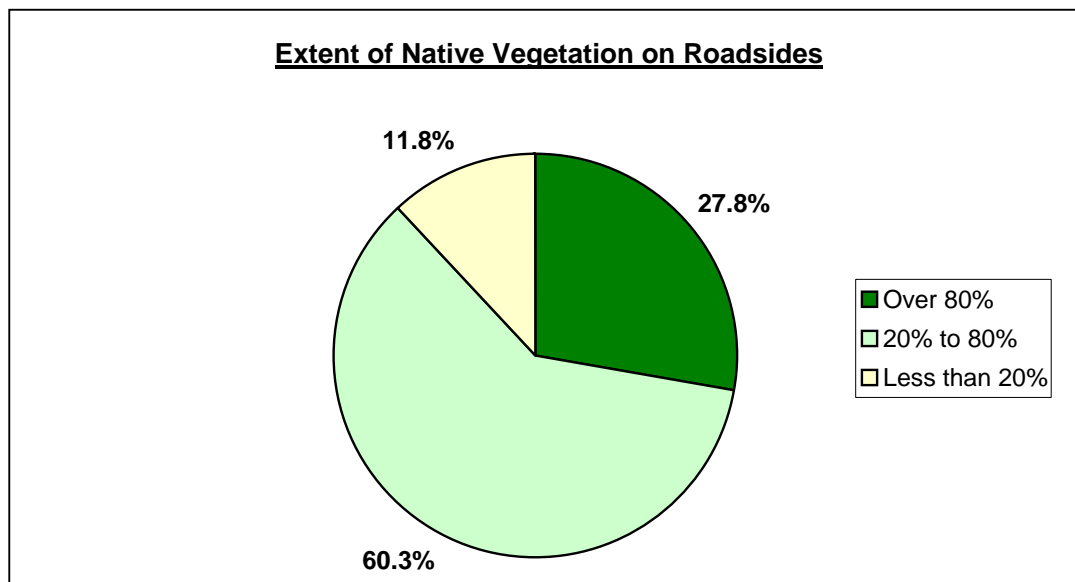


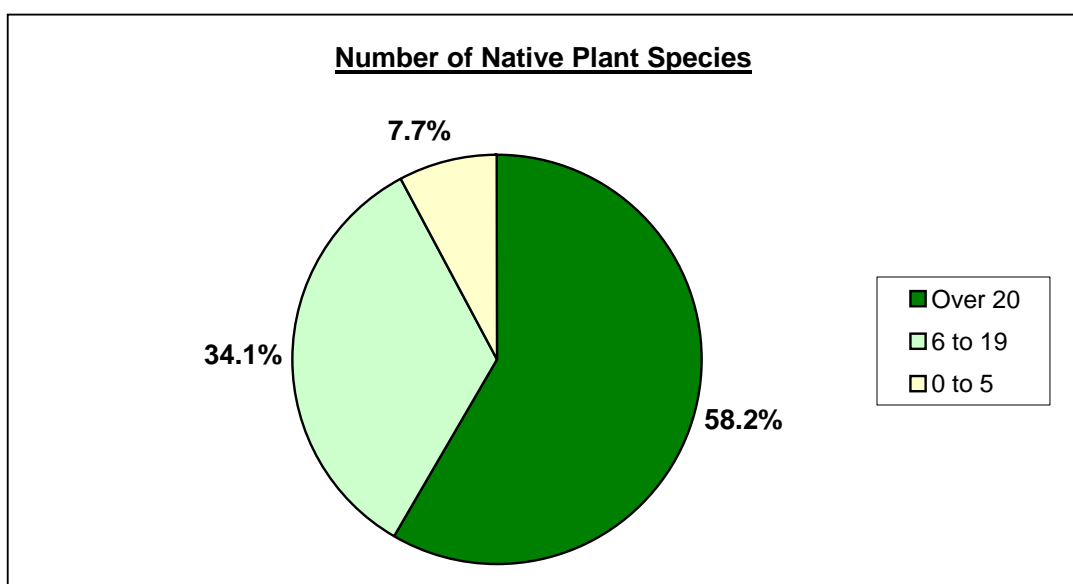
Figure 5– Native vegetation on roadsides in the Shire of Dalwallinu.

Roadside vegetation with extensive cover, i.e. greater than 80%, occurred along 27.8% of the roadsides surveyed (265.0 km). Survey sections with 20% to 80% vegetation cover accounted for 60.3% of the roadsides (574.7 km). The remaining 11.8% had less than 20% native vegetation (112.9 km), and therefore, a low 'extent of native vegetation' value, see Table 4, Figure 6.



**Figure 6 – Extent of native vegetation along roadsides in the Shire of Dalwallinu.**

The 'number of native species' score provided a measure of the diversity of the roadside vegetation. Survey sections with more than 20 plant species spanned 554.4 km (58.2%) of the roadside. Roadside sections with 6 to 19 plant species accounted for 324.9 km (34.1%) of the roadside. The remaining 73.1 km (7.7%) contained less than 5 plant species, see Table 4, Figure 7.



**Figure 7 – Number of native plant species within roadsides in the Shire of Dalwallinu.**

Roadsides determined to have high value as biological corridors (as determined by the roadside surveyors) were present along 78.8% (750.9 km) of the roadside, medium value made up 11.8% (112.8 km), and roadsides with low value as a biological corridor occurred along 9.3% (88.8 km) of the roadsides surveyed, see Table 4, Figure 8.

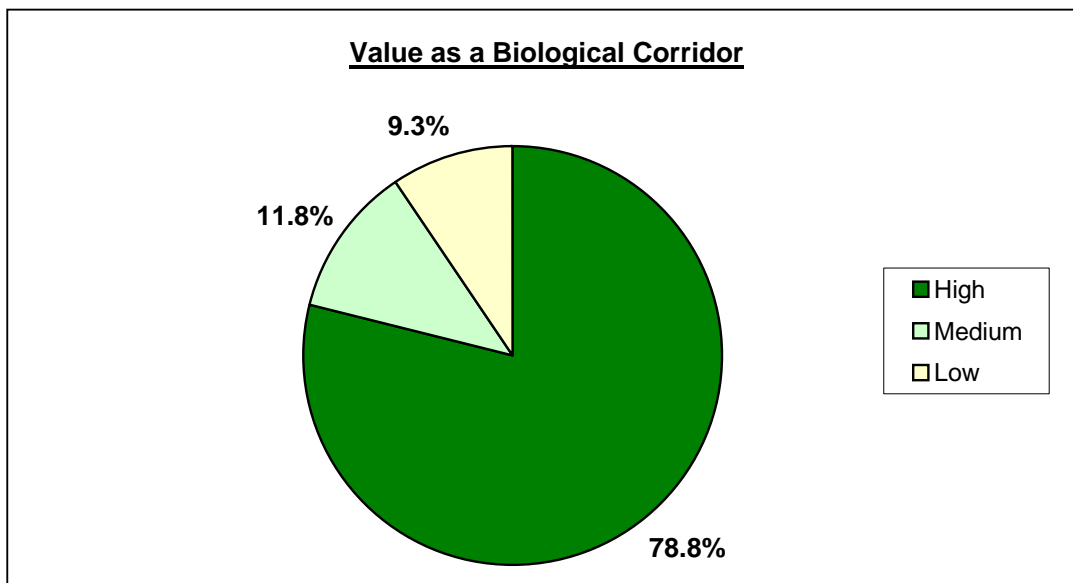


Figure 8 – Value as a biological corridor.

Light levels of weed infestation were observed on 29.1% (277.0 km) of the roadsides surveyed, medium level weed infestation occurred on 36.8% (350.6 km) of the roadsides and 34.1% (325.0 km) were heavily infested with weeds, see Table 4, Figure 9.

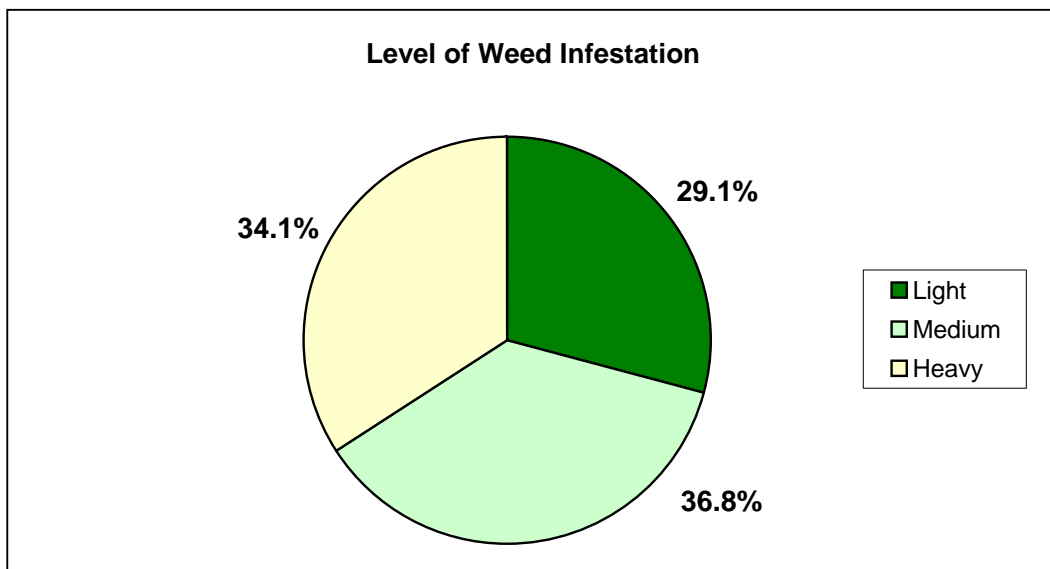
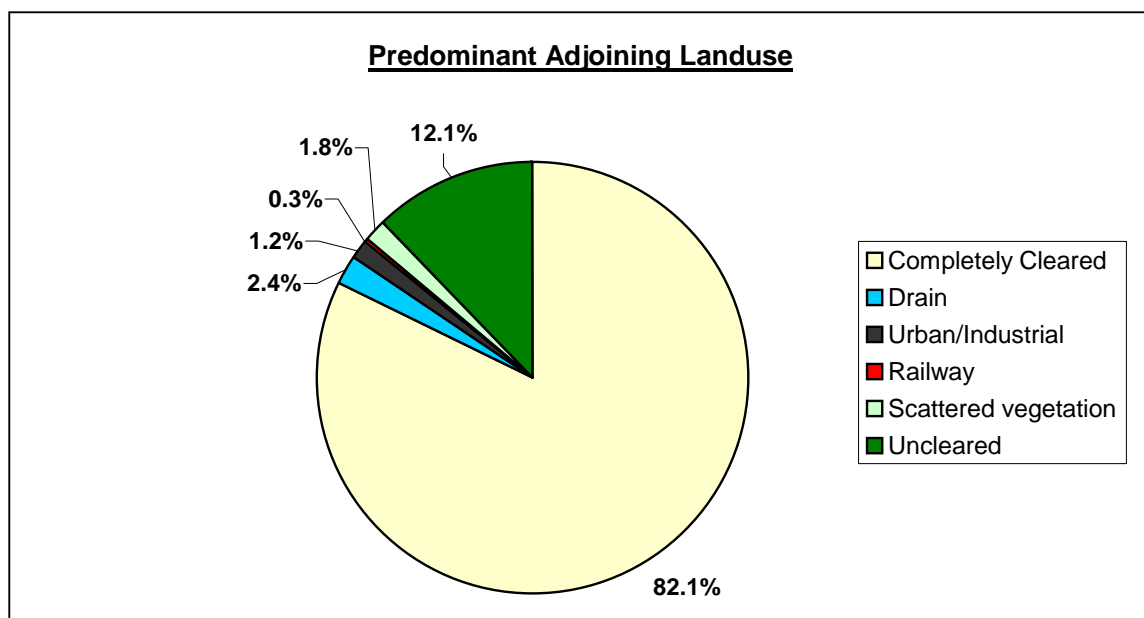


Figure 9 – Weed infestation. Light weed infestation = weeds less than 20% of total plants. Medium weed infestation = weeds 20 to 80% of the total plants. Heavy infestation = weeds more than 80% of the total plants.



Uncleared native vegetation was present on 12.1% (115.5km) of the land adjoining roadsides, whilst 82.1% (782.3 km) of roadsides surveyed were adjoined by land that had been completely cleared for agriculture. 1.8% (17.6 km) of the roadsides surveyed were bordered by land that was cleared for agriculture, but contained a scattered distribution of native vegetation. Drains were the predominant adjoining landuse for 2.4% (22.7 km) of the roadsides surveyed, urban/industrial landuses adjoined 1.2% (11.5 km), and railway reserves adjoined 0.3% (2.9 km) of the roadsides surveyed, see Table 4, Figure 10.



**Figure 10 – Predominant adjoining land use.**

Roadside populations of the following nominated weeds are indicated on clear overlays accompanying the 2003 RCV map:

- Cape weed;
- Pimpernel;
- Paterson's curse;
- Wild oats
- Barley grass
- Skeleton weed

Wild Mustard was also recorded under the category 'Other weeds', and is represented in Figure 11, with the other 6 nominated weed species observed along roadsides in the Shire.

Of the 6 nominated weeds surveyed throughout 2003, Wild oats were the most highly recorded weed category, occurring along 1004.0 km of roadsides. Cape weed was present along 720.7 km of the roadsides surveyed, whilst Paterson's curse was recorded along 568.9 km of roadside. Barley grass was the next most commonly recorded weed,

occurring along 338.4 km, Mustard was present along 75.5 km, Skeleton weed 32.2 km, and Pimpernel 28 km of roadside, see Figure 11.

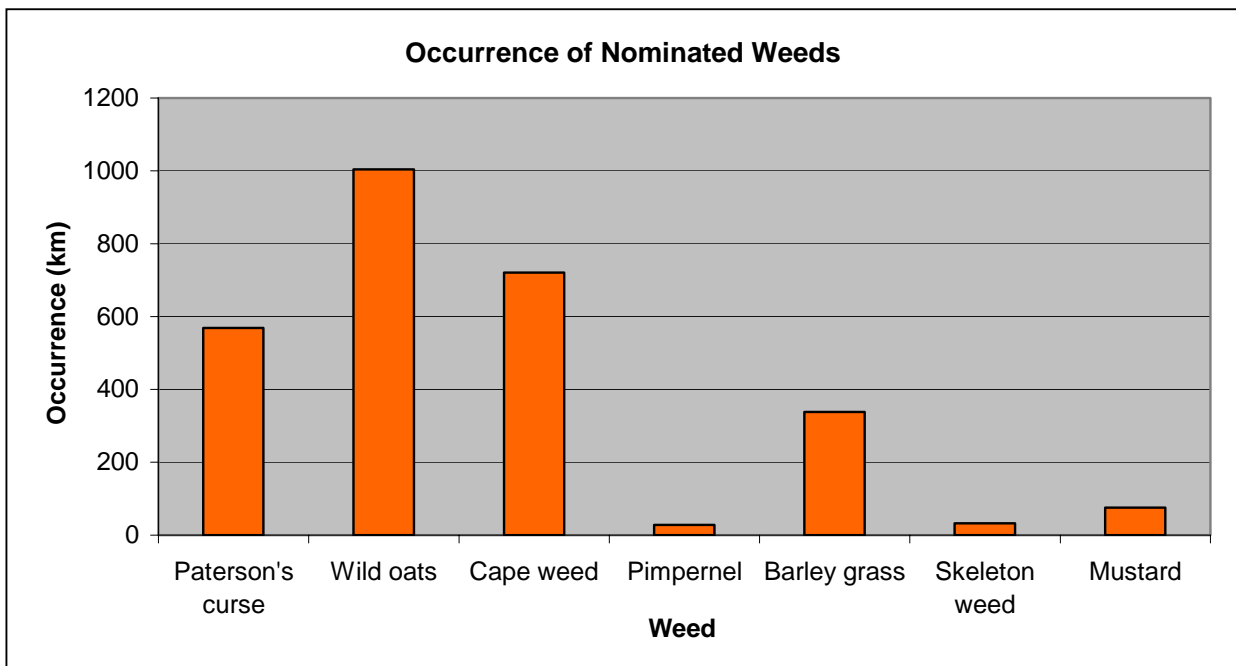






Figure 11 – Occurrence of nominated weeds along roadsides in the Shire of Dalwallinu



## 7.0 MANAGEMENT TECHNIQUES

The primary aim of road management is the creation and maintenance of a safe, efficient road system. However, the following management procedures are recommended and should be adopted. The following section provides management recommendations that will assist in retaining and enhancing roadside conservation value. These guidelines are taken from the Roadside Conservation Committee's *Roadside Manual* and the *Roadside Handbook*.

The Executive Officer of the Roadside Conservation Committee is also available to assist on all roadside conservation matters, and can be contacted on (08) 9334 0423.

<b>High Conservation Value Roadsides</b>		
Management Goal		Maintain and enhance the native plant communities.
Management Guidelines		Minimal disturbance to existing vegetation. Disturbance leads to weed invasion, which downgrades the conservation value, and increases the fire threat.

<b>Medium Conservation Value Roadsides</b>		
Management Goal		Maintain native vegetation wherever possible, and encourage its regeneration.
Management Guidelines		Minimise disturbance to existing vegetation.

<b>Low Conservation Value Roadsides</b>		
Management Goal		Retain remnant trees and shrubs and encourage their regeneration.  Encourage revegetation projects using indigenous plants.
Management Guidelines		Minimise soil disturbance to reduce weed invasion. Encourage revegetation projects by adjacent landholders.

**Minimal disturbance can be achieved by:**

- Adopting a road design that occupies the minimum space;
- Diverting the line of a table drain to avoid disturbing valuable flora;
- Pruning branches, rather than removing the whole tree or shrub;
- Not dumping spoil on areas of native flora;
- Observing dieback control measures as required;
- Apply the Fire Threat Assessment (Roadside Manual) before burning roadside vegetation;
- Use methods other than fuel reduction burns to reduce fire threat; if roadside burning must be undertaken, incorporate it into a district fire management program;
- Encourage adjacent landholders to set back fences to allow roadside vegetation to proliferate;
- Encourage adjacent landholders to plant windbreaks or farm tree lots adjacent to roadside vegetation to create a denser windbreak or shelterbelt;
- Encourage revegetation projects by adjacent landholders.

**7.1 Environmental Guidelines**

An Environmental Guidelines has been developed through collaboration with Main Roads Western Australia, the Western Australian Local Government Association and the Roadside Conservation Committee. It is anticipated that this document will be accepted as an industry standard for all working or interested in roadside conservation. This document provides defined parameters for all roadside management works and also provides the local community with an overview of management practices that will ensure the sustainability of native roadside vegetation. Please contact the Roadside Conservation Committee on 9334 0423 for further information.

**7.2 Tree Roads**

Tree roads are defined as those roadsides with a sufficient density of mature trees to create an attractive tunnel effect. Besides the aesthetic benefits, these areas also provide valuable habitat for birds and other arboreal fauna. Since mature trees are slow growing and hard to replace, care should be taken to conserve these avenues wherever possible. The following points should be considered when working on tree roads:

- prune offending branches rather than remove the whole tree;
- cut branches off close to limb or tree trunk;
- divert line of table drain to avoid disturbing tree roots;
- import fill to build up formation, rather than using side-borrow from roadside;
- when using herbicide for weed control on the roadside do not use a soil residual type, such as Simazine or Atrazine. Eucalypts are especially sensitive to these;

- encourage the adjoining landholders to plant shelter belts on their property that will complement the roadside vegetation.

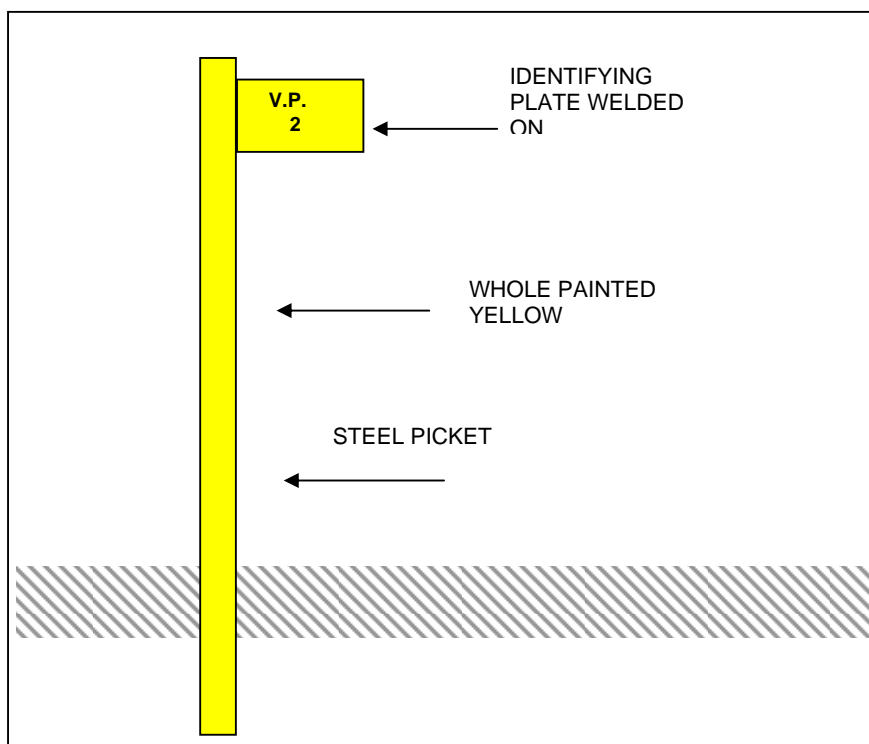
### 7.3 Special Environment Areas

A Special Environmental Area is a section of roadside, which has such significance that it requires special protection. Reasons for establishing Special Environmental Areas can include:

- Protection of rare or threatened species of native plants;
- Protection of sites that have other high conservation, scientific or aesthetic values;
- Protection of Aboriginal or European cultural sites.

Special Environmental Areas can be delineated by the use of site markers. See Figures 9 and 10 for design and placement of SEA markers. Workers who come across a 'Special Environmental Area' marker in the field should not disturb the area between the markers unless specifically instructed. If in doubt, the Supervisor, Shire Engineer or CEO should be contacted.

Western Power and West Net rail also have systems for marking sites near power or rail lines. Examples of these are seen in the figure below.



**Figure 12 - Special Environmental Area site marker.**

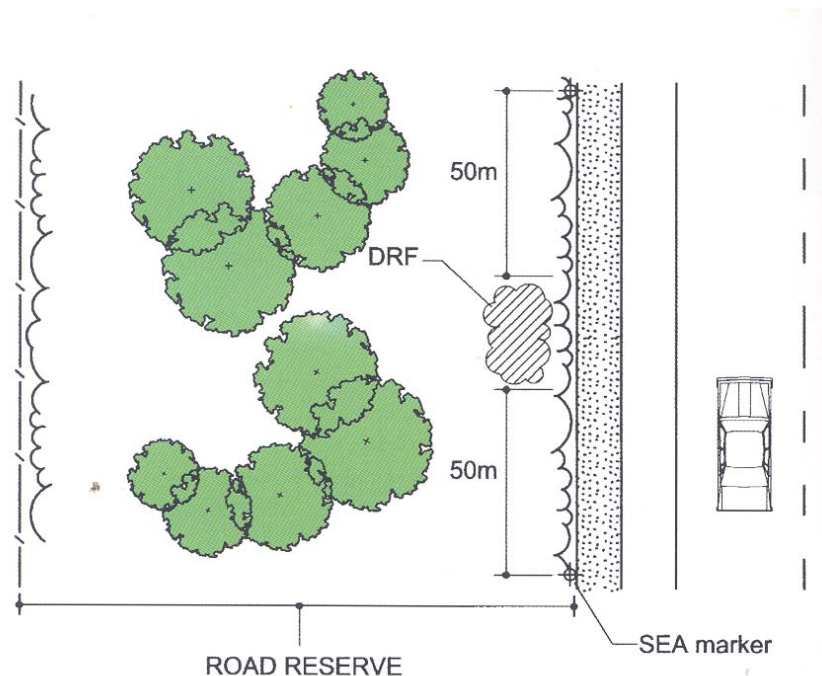


## 7.4 Special Environmental Area Register

To ensure that knowledge of rare flora and other sites does not get lost due, perhaps, to staff changes, a Local Authority should establish a Special Environmental Area Register. This should outline any special treatment, which the site should receive, and be consulted prior to any work being initiated in the area.

The Special Environmental Area Register should be consulted by the appropriate person prior to starting work on any particular road, to ensure that inadvertent damage does not occur. All Special Environment Area sites should be marked on the Shire map, which records Roadside Conservation Value

Local Government is encouraged to permanently mark Special Environmental Areas to prevent inadvertent damage to the rare flora or other values being protected. Markers of a uniform shape and colour will make recognition easier for other authorities using road reserves.



**Figure 13 - Marking Special Environmental Area (SEA) sites in the field. In this case, a declared rare flora (DRF) site has been marked.**

When notified of a population needing marking, the Local Authority should contact the appropriate Department of Conservation and Land Management Regional or District office for assistance to ensure the exact site location and correct positioning of marker posts.

## 8.0 ROADSIDE PLANNING, STRATEGIES AND ACTION PLANS

### 8.1 Planning

The RCC is able to provide good models of Roadside Management Plans and encourages all shires to adopt this practice of planning for roadside conservation. The following actions greatly enhance likelihood of a plan that changes behaviour and results in on-ground actions:

- Community support encourage ongoing community involvement and commitment by establishing a local Roadside Advisory Committee or working group within the Shire Environmental Committee;
- Contract specifications maintain roadside values by developing environmental specifications for inclusion in all tender documents or work practices;
- Community education use of innovative and pertinent material can increase community understanding of roadside values;
- Training promote local roadside planning initiatives and gain acceptance and understanding by involving shire staff, contractors, utility provider staff and the community in workshops, seminars or training days. The Roadside Conservation Committee can provide this training.

Training develops recognition and understanding of roadside values and highlights best work practices. Workshops are developed to ensure that local issues and environments are dealt with and they include site visits to high conservation remnants, current projects and works.

The objective of all roadside management planning should be to:

- **Protect**
  - native vegetation
  - rare or threatened flora or fauna
  - cultural and heritage values
  - community assets from fire
- **Maintain**
  - safe function of the road
  - native vegetation communities
  - fauna habitats and corridors
  - visual amenity and landscape qualities
  - water quality
- **Minimise**
  - land degradation
  - spread of weeds and vermin
  - spread of soil borne pathogens
  - risk and impact of fire
  - disturbance during installation and maintenance of service assets
- **Enhance**
  - indigenous vegetation communities
  - fauna habitats and corridors

## 8.2 Strategies

The development of a strategy enables potentially competing uses to coexist and ensures that roadsides are managed in a coordinated approach. When producing regional strategies the RCC suggests that:

- Organisational support from local government is essential from the outset;
- Strategies should take no longer than 12 months to produce (including a period for community comment);
- Communities need to be provided with background information to make formal decisions.

Management strategies should be produced to address local issues, rather than be to a standard format. Issues can be categorised as:

### ➤ **Functional**

- Fire prevention
- Installation and maintenance of services
- Road construction and maintenance
- Stockpile and dumpsite management
- Vegetation removal
- Vehicle and machinery activity
- Water supply catchments

### ➤ **Cultural and Recreational**

- Cultural and heritage values
- Horse riding
- Visual amenity and landscape values
- Wayside stops

### ➤ **Landcare**

- Apiculture
- Insect Pests
- Pest animals
- Ploughing, cultivating or grading
- Revegetation and site rehabilitation
- Weeds

### ➤ **Conservation**

- Protecting and conserving remnant native vegetation
- Rare, threatened or significant flora and fauna
- Regeneration of native plant communities
- Roadside marking of special environmental areas
- Unused road reserves
- Wetlands
- Wildlife habitat
- Wildlife corridors

### 8.3 Roadside Action Plans

A Roadside Action Plan is prepared for an individual road and contains a works program that will enable conservation values and other road uses to be managed compatibly.

Roadside Action Plans are based on the guidelines that are produced as part of the roadside strategy.

The RCC suggests that Roadside Action Plans be:

- short term documents (to be reviewed within 2 years);
- prepared on a need basis;
- prepared after consultation with major stakeholders;
- a maximum of 2 pages per road;
- names a person or agency responsible for implementing the management recommendations.



**Roadside Action Plans may, for example, aim to eradicate invasive weeds such as African Lovegrass from roadsides. Weed overlays may be helpful in identifying strategic locations.**

## References

- Beeston, G., Mlodawski, G., Saunders, A and True, D. (1993, unpub.). *Remnant Vegetation Inventory in the Southern Agricultural Areas of Western Australia*. Western Australian Department of Agriculture, South Perth.
- Department of Agriculture WA, Client and Resource Information System (2004), *Land-use Zones in Western Australia*, February 2004.
- Environment Australia. (2001), National Objectives and Targets for Biodiversity Conservation 2001-2005. Environment Australia, Canberra, Australia.
- Jackson, K A (2002) *Assessing Roadsides A Guide to Rating Conservation Value*, Roadside Conservation Committee, Kensington, Western Australia
- Lamont, D.A. and Blyth, J.D. (1995). Roadside corridors and community networks, pp 425-35. In *Nature Conservation 4: The Role of Networks*, ed by Saunders, D.A., Craig J.L., and Mattiske E.M. Surrey Beatty & Sons, 1995.
- Lamont D A (1998) *Western Australian Roadside Handbook, Environmental guidelines for road construction and maintenance workers*. Roadside Conservation Committee, Kensington, Western Australia.
- Lamont D A and Atkins K (2000) *Guidelines for Managing Special Environmental Areas in Transport Corridors*. Roadside Conservation Committee, Kensington, Western Australia.
- Platt, S.J. and Lowe, K.W., (2002). Biodiversity Action Planning: Action planning for native biodiversity at multiple scales – catchment, bioregional, landscape, local. Department of Natural Resources and Environment, Melbourne.
- Roadside Conservation Committee. (1990). *Roadside Manual* Roadside Conservation Committee, Como WA
- Shepherd, D. P., Beeston, G.R. and Hopkins, A. J. M. (2001). Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture, Western Australia, South Perth
- Shire of Dalwallinu (2004) <http://www.dalwallinu.wa.gov.au/>

# Appendix

# 1

# APPENDIX 1

## Definitions of Remnant Vegetation Types, Beeston et al (1993).

Vegetation classed as "**remnant vegetation**" has one or more of the following characteristics:

- \* Most closely reflects the natural state of vegetation for a given area.
- \* Has an intact understorey (if forest or woodland).
- \* Has minimal disturbance by agents of human activity.

Vegetation classed as "**modified vegetation**" has one or more of the following characteristics:

- \* Degraded understorey (i.e. reduction in the number of native species, includes weeds).
- \* Obvious human disturbance, i.e. clearing, mining, grazing, weeds.
- \* Affected by salt.
- \* Narrow corridors of vegetation (usually along roads and railway lines or windbreaks), which are more likely to be affected by edge effects.

Vegetation classed as "**scattered vegetation**" has:

- \* No understorey
- \* Parkland cleared i.e. scattered single trees.
- \* No significant signs or chance of regeneration.

# Appendix

## 2





# Appendix

## 3



# Appendix

## 4

## APPENDIX 4

### Native Plant species in the Shire of Dalwallinu

Note – Not a fully comprehensive list.

\* indicates weed species.

Acacia acanthoclada subsp. acanthoclada	Acacia isoneura ms
Acacia aciphylla	Acacia isoneura subsp. isoneura ms P3
Acacia acuaria	Acacia jacksonioides
Acacia acuminata	Acacia jennerae
Acacia acuminata subsp. acuminata ms	Acacia jibberdingensis
Acacia acuminata subsp. burkittii ms	Acacia kalgoorliensis P3
Acacia acutata	Acacia kochii
Acacia ancistrophylla var. ancistrophylla	Acacia lasiocalyx
Acacia ancistrophylla var. lissophylla	Acacia latipes
Acacia andrewsii	Acacia leptospermoides subsp. leptospermoides
Acacia anthochaera	Acacia ligulata
Acacia ashbyae	Acacia ligustrina
Acacia assimilis subsp. assimilis	Acacia lineolata subsp. basalis ms
Acacia beauverdiana	Acacia lineolata subsp. lineolata
Acacia bidentata	Acacia lineolata subsp. multilineata P1
Acacia brumalis	Acacia lirellata subsp. compressa ms P2
Acacia chrysella	Acacia longiphyllodinea
Acacia colletioides	Acacia longispinea
Acacia congesta subsp. congesta ms	Acacia mackeyana
Acacia consanguinea ms	Acacia merrallii
Acacia coolgardiensis subsp. coolgardiensis	Acacia microbotrya
Acacia coolgardiensis subsp. effusa	Acacia multispicata
Acacia coolgardiensis subsp. latior	Acacia murrayana
Acacia costata	Acacia neurophylla subsp. erugata
Acacia cylindrica P3	Acacia nigripilosa
Acacia daviesioides	Acacia nigripilosa subsp. latifolia ms P1
Acacia deficiens ms	Acacia nigripilosa subsp. nigripilosa ms
Acacia densiflora	Acacia nyssophylla
Acacia dielsii	Acacia obtecta
Acacia dissona var. indoloria P3	Acacia orbifolia
Acacia duriuscula	Acacia oswaldii
Acacia enervia	Acacia prainii
Acacia enervia subsp. explicata	Acacia pravifolia
Acacia eremaea	Acacia ramulosa
Acacia eremophila var. eremophila	Acacia resinimarginea
Acacia eremophila var. variabilis P3	Acacia resinosa ms
Acacia erinacea	Acacia restiacea
Acacia erioclada	Acacia rostelifera
Acacia fragilis	Acacia saligna
Acacia gibbosa	Acacia saxatilis
Acacia glutinosissima	Acacia scalena ms P3
Acacia graniticola ms	Acacia sericocarpa
Acacia hemiteles	Acacia sibina
Acacia heteroneura var. jutsonii	Acacia signata
Acacia heteroneura var. petila	Acacia sphacelata subsp. sphacelata ms
Acacia heteroneura var. proluxa	Acacia stanleyi ms
Acacia inceana subsp. conformis P1	Acacia stereophylla var. stereophylla
Acacia inceana subsp. latifolia ms	Acacia subrigida P2

Acacia synoria ms  
 Acacia tetragonophylla  
 Acacia trinalis ms P1  
 Acacia tysonii  
 Acacia ulicina  
 Acacia victoriae  
 Acacia yorkrakinensis  
 Acacia yorkrakinensis subsp. acrita  
 Acacia ? aulacophylla  
 Acacia ? fragilis  
 Acacia ? microbotrya  
 Acacia ? nigripilosa subsp. ? nigripilosa ms  
 Acetosa vesicaria  
 Actinobole uliginosum  
 Actinostrobos arenarius  
 Actinotus humilis  
 Actinotus superbis  
 Actites megalocarpa  
 Adenanthos drummondii  
 Allium ampeloprasum  
 Allocasuarina acutivalvis  
 Allocasuarina acutivalvis subsp. acutivalvis  
 Allocasuarina acutivalvis subsp. prinsepiana  
 Allocasuarina campestris  
 Allocasuarina corniculata  
 Allocasuarina dielsiana  
 Allocasuarina humilis  
 Allocasuarina microstachya  
 Alyogyne pinoniana  
 Alyxia buxifolia  
 Amphibromus nervosus  
 Amphipogon caricinus  
 Amphipogon strictus  
 Andersonia heterophylla  
 Andersonia lehmanniana subsp. pubescens  
 Angianthus micropodioides P3  
 Angianthus tomentosus  
 Anigozanthos flavidus  
 Anthocercis anisantha subsp. anisantha  
 Anthocercis littorea  
 Anthotroche pannosa  
 Aotus tietkensis  
 Argyroglottis turbinata  
 Aristida contorta  
 Arthropodium dyeri  
 Asphodelus fistulosus  
 Astartea clavifolia P2  
 Astartea heteranthera  
 Astroloma glaucescens  
 Astroloma serratifolium  
 Astroloma serratifolium var. horridulum  
 Atriplex bunburyana  
 Atriplex holocarpa  
 Atriplex hymenotheca  
 Atriplex paludosa subsp. baudinii  
 Atriplex semibaccata  
 Atriplex semilunaris  
 Atriplex vesicaria  
 Austrodanthonia caespitosa  
 Austrostipa nitida  
 Austrostipa trichophylla  
 Avena barbata  
 Avena fatua  
 Baeckea benthamii ms  
 Baeckea crispiflora  
 Baeckea cryptandroides  
 Baeckea cryptonoma ms  
 Baeckea elderiana  
 Baeckea grandiflora  
 Baeckea grandis  
 Baeckea megafloa ms  
 Baeckea muricata  
 Baeckea recurva ms  
 Baeckea sp. Wubin (M.E. Trudgen 5404)  
 Balaustion pulcherrimum  
 Banksia attenuata  
 Banksia benthamiana P4  
 Bassia scoparia  
 Beaufortia bracteosa  
 Beaufortia elegans  
 Beaufortia interstans  
 Bellida graminea  
 Blennospora drummondii  
 Boronia adamsiana R  
 Boronia coerulescens  
 Boronia coerulescens subsp. spicata  
 Boronia ericifolia P2  
 Borya constricta  
 Borya nitida  
 Borya sphaerocephala  
 Bossiaea peduncularis  
 Brachypodium distachyon  
 Brachyscome ciliaris  
 Brachyscome ciliocarpa  
 Brachyscome iberidifolia  
 Brachyscome perpusilla  
 Brachyscome pusilla  
 Brassica tournefortii  
 Bromus rubens  
 Brunonia australis  
 Bursaria occidentalis  
 Caladenia cristata P4  
 Caladenia drummondii  
 Caladenia radialis  
 Caladenia roei  
 Caladenia vulgata ms  
 Calandrinia eremaea  
 Calandrinia primuliflora  
 Callitris glaucophylla  
 Calothamnus chrysantherus  
 Calothamnus gilesii  
 Calothamnus quadrifidus

*Calothamnus quadrifidus* var. "unsorted"  
*Calotis hispidula*  
*Calycopeplus paucifolius*  
*Calytrix depressa*  
*Calytrix glutinosa*  
*Calytrix gracilis*  
*Calytrix habrantha*  
*Calytrix leschenaultii*  
*Calytrix plumulosa* P3  
*Calytrix strigosa*  
*Cassytha glabella* forma dispar  
*Cassytha melantha*  
*Cassytha nodiflora*  
*Casuarina obesa*  
*Centaurea melitensis*  
*Centrolepis cephaliformis* subsp. *cephaloformis*  
*Centrolepis polygyna*  
*Cephalopterum drummondii*  
*Ceratogyne obionoides*  
*Chamaescilla corymbosa* var. *latifolia*  
*Chamaexeros fimbriata*  
*Chamaexeros macranthera*  
*Chamelaucium brevifolium*  
*Chamelaucium conostigmum* ms P3  
*Chamelaucium drummondii*  
*Chamelaucium drummondii* subsp. *drummondii*  
ms  
*Chamelaucium drummondii* subsp. *hallii* ms  
*Chamelaucium micranthum*  
*Chamelaucium pauciflorum*  
*Chamelaucium pauciflorum* subsp.  
*thryptomenioides* ms  
*Chamelaucium pauciflorum thryptomenioides* ms  
*Cheilanthes* aff. *austrotenuifolia*  
*Cheilanthes austrotenuifolia*  
*Cheilanthes sieberi* subsp. *sieberi*  
*Chenopodium melanocarpum*  
*Chenopodium pumilio*  
*Chondrilla juncea*  
*Chorizema aciculare* subsp. *laxum*  
*Chorizema racemosum*  
*Chorizema rynchotropis*  
*Chrysitrix distigmatosa*  
*Chrysocoryne trifida*  
*Chthonocephalus pseudevax*  
*Clematis delicata* ms  
*Codonocarpus cotinifolius*  
*Comesperma drummondii*  
*Comesperma integerrimum*  
*Comesperma scoparium*  
*Comesperma spinosum*  
*Comesperma volubile*  
*Commersonia pulchella*  
*Commersonia stowardii*  
*Conospermum amoenum* subsp. *amoenum*  
*Conospermum boreale* subsp. *ascendens* ms  
*Conospermum brownii*  
*Conospermum polycephalum*  
*Conospermum stoechadis* subsp. *stoechadis*  
*Conostylis aculeata* subsp. *bromelioides*  
*Conostylis androstemma*  
*Conostylis aurea*  
*Convolvulus remotus*  
*Cotula bipinnata*  
*Crassula colorata* var. *acuminata*  
*Crassula exserta*  
*Cratystylis subspinescens*  
*Cryptandra apetala* var. *apetala*  
*Cryptandra arbutiflora* var. *intermedia*  
*Cryptandra imbricata* ms P3  
*Cryptandra micrantha* ms  
*Cryptandra myriantha*  
*Cryptandra nutans*  
*Cyanicula deformis* ms  
*Cyanostegia angustifolia*  
*Cyanostegia microphylla*  
*Cyanostegia microphylla*  
*Cyphanthera odgersii* subsp. *occidentalis* R  
*Cyphanthera racemosa*  
*Dactyloctenium radulans*  
*Dampiera altissima*  
*Dampiera eriocephala*  
*Dampiera juncea*  
*Dampiera lavandulacea*  
*Dampiera luteiflora*  
*Dampiera stenostachya*  
*Dampiera tenuicaulis* var. *tenuicaulis*  
*Dampiera tomentosa*  
*Dampiera wellsiana*  
*Darwinia capitellata*  
*Darwinia chapmaniana* ms R  
*Darwinia halophila* ms  
*Darwinia purpurea*  
*Daucus glochidiatus*  
*Daviesia benthamii* subsp. *benthamii*  
*Daviesia cardiophylla*  
*Daviesia dielsii* P2  
*Daviesia grahamii*  
*Daviesia hakeoides* subsp. *subnuda* ms  
*Daviesia nematophylla*  
*Daviesia nudiflora* subsp. *amplectens*  
*Daviesia nudiflora* subsp. *nudiflora*  
*Daviesia triflora*  
*Dianella revoluta*  
*Dianella revoluta* var. *divaricata*  
*Dicrastylis fulva*  
*Dicrastylis parvifolia*  
*Dicrastylis reticulata*  
*Didymanthus roei*  
*Dithyrostegia amplexicaulis*  
*Dodonaea adenophora*  
*Dodonaea bursariifolia*

Dodonaea caespitosa  
 Dodonaea divaricata  
 Dodonaea inaequifolia  
 Dodonaea larreoides  
 Dodonaea viscosa subsp. angustissima  
 Drosera macrantha  
 Drosera macrantha subsp. macrantha  
 Drosera macrophylla  
 Drosera pallida  
 Drosera ramellosa  
 Drosera stolonifera subsp. rupicola  
 Drosera stricticaulis  
 Drummondita hassellii  
 Drummondita hassellii var. hassellii  
 Dryandra conferta var. conferta  
 Dryandra fraseri var. fraseri  
 Dryandra purdieana  
 Duboisia hopwoodii  
 Ecdeiocolea monostachya  
 Emex australis  
 Enchylaena lanata  
 Enchylaena tomentosa var. tomentosa  
 Enteropogon acicularis  
 Eragrostis dielsii  
 Eremaea beaufortoides  
 Eremaea ectadioclada  
 Eremaea pauciflora subsp. pauciflora  
 Eremaea pauciflora var. lonchophylla  
 Eremaea pauciflora var. pauciflora  
 Eremophila caperata ms  
 Eremophila clarkei  
 Eremophila decipiens  
 Eremophila decipiens subsp. decipiens ms  
 Eremophila deserti  
 Eremophila drummondii  
 Eremophila glabra  
 Eremophila granitica  
 Eremophila lehmanniana  
 Eremophila miniata  
 Eremophila oldfieldii subsp. angustifolia ms  
 Eremophila oldfieldii subsp. oldfieldii  
 Eremophila oppositifolia  
 Eremophila oppositifolia subsp. angustifolia ms  
 Eremophila oppositifolia var. angustifolia ms  
 Eremophila pinnatifida ms R  
 Eremophila sargentii P2  
 Eremophila serrulata  
 Eremophila subfloccosa subsp. lanata ms  
 Eremophila vernicosa ms X  
 Eriachne ovata  
 Erichsenia uncinata  
 Eriochilus scaber subsp. scaber ms  
 Eriostemon brucei subsp. brucei  
 Eriostemon deserti  
 Eriostemon glaber  
 Eriostemon nutans P1  
 Eriostemon sericeus  
 Eriostemon thryptomenoides  
 Eriostemon tomentellus  
 Erodium cygnorum  
 Erodium cygnorum subsp. cygnorum  
 Erymophyllum glossanthus  
 Erymophyllum tenellum  
 Eucalyptus aequioperta  
 Eucalyptus aff. leptophylla  
 Eucalyptus aff. rigidula  
 Eucalyptus albida  
 Eucalyptus baudiniana  
 Eucalyptus brachycorys  
 Eucalyptus burracoppinensis  
 Eucalyptus capillosa subsp. capillosa  
 Eucalyptus capillosa subsp. polyclada  
 Eucalyptus celastroides subsp. virella  
 Eucalyptus ceratocorys  
 Eucalyptus crucis subsp. lanceolata  
 Eucalyptus ebbanoensis subsp. ebbanoensis  
 Eucalyptus erythronema var. marginata  
 Eucalyptus eudesmioides subsp. eudesmioides  
 Eucalyptus ewartiana  
 Eucalyptus gracilis  
 Eucalyptus hypochlamydea subsp. ecdysiastes  
 ms  
 Eucalyptus hypochlamydea subsp.  
 hypochlamydea ms  
 Eucalyptus kochii subsp. kochii  
 Eucalyptus kochii subsp. plenissima  
 Eucalyptus leptopoda subsp. arctata  
 Eucalyptus loxophleba subsp. lissophloia  
 Eucalyptus loxophleba subsp. supralaevis  
 Eucalyptus macrocarpa subsp. macrocarpa  
 Eucalyptus myriadena subsp. myriadena  
 Eucalyptus obtusiflora  
 Eucalyptus oldfieldii  
 Eucalyptus petraea  
 Eucalyptus polita  
 Eucalyptus pyriformis  
 Eucalyptus rigidula  
 Eucalyptus salicola  
 Eucalyptus salubris  
 Eucalyptus sargentii subsp. sargentii  
 Eucalyptus semivestita ms  
 Eucalyptus sheathiana  
 Eucalyptus stowardii  
 Eucalyptus striaticalyx  
 Eucalyptus subangusta  
 Eucalyptus subangusta subsp. pusilla  
 Eucalyptus subangusta subsp. subangusta  
 Eucalyptus subangusta subsp. virescens P1  
 Eucalyptus synandra R  
 Eucalyptus tenera  
 Eucalyptus transcontinentalis  
 Eucalyptus wandoo subsp. pulverea



Eucalyptus x carnabyi P4  
 Euphorbia drummondii  
 Euryomyrtus recurva ms  
 Exocarpos aphyllus  
 Exocarpos sparteus  
 Frankenia cinerea  
 Frankenia pauciflora  
 Frankenia setosa  
 Gahnia aristata  
 Gahnia drummondii  
 Gastrolobium appressum R  
 Gastrolobium bennettsianum  
 Gastrolobium calycinum  
 Gastrolobium floribundum  
 Gastrolobium laytonii  
 Gastrolobium rotundifolium P1  
 Gastrolobium spinosum  
 Gastrolobium spinosum var. grandiflorum  
 Gastrolobium spinosum var. spinosum  
 Geleznovia verrucosa P3  
 Gilberta tenuifolia  
 Gilruthia osbornei  
 Glischrocaryon aureum  
 Glischrocaryon aureum var. angustifolium  
 Glischrocaryon roei  
 Glycine clandestina  
 Gnephosis setifera P1  
 Gnephosis tenuissima  
 Gnephosis tridens  
 Gnephosis trifida  
 Gnephosis uniflora  
 Gompholobium obcordatum  
 Gonocarpus nodulosus  
 Goodenia berardiana  
 Goodenia convexa  
 Goodenia helmsii  
 Goodenia incana  
 Goodenia mimuloides  
 Goodenia occidentalis  
 Goodenia perryi P1  
 Goodenia pinifolia  
 Goodenia tripartita  
 Goodenia watsonii subsp. watsonii  
 Grevillea acacioides  
 Grevillea acuaria  
 Grevillea apiciloba subsp. apiciloba  
 Grevillea armigera  
 Grevillea asparagoides P3  
 Grevillea biformis subsp. biformis  
 Grevillea biternata  
 Grevillea brachystachya  
 Grevillea bracteosa P2  
 Grevillea candicans P3  
 Grevillea didymobotrya subsp. didymobotrya  
 Grevillea dielsiana  
 Grevillea dryandroides subsp. dryandroides R  
 Grevillea eremophila  
 Grevillea eriobotrya P3  
 Grevillea eriostachya  
 Grevillea eryngioides  
 Grevillea excelsior  
 Grevillea extorris  
 Grevillea granulosa P3  
 Grevillea hakeoides subsp. stenophylla  
 Grevillea haplantha subsp. recedens  
 Grevillea huegelii  
 Grevillea juncifolia subsp. temulenta  
 Grevillea kenneallyi P1  
 Grevillea leucopteris  
 Grevillea levis  
 Grevillea nana  
 Grevillea nana subsp. abbreviata P2  
 Grevillea obliquistigma subsp. funicularis  
 Grevillea obliquistigma subsp. obliquistigma  
 Grevillea paniculata  
 Grevillea paradoxa  
 Grevillea petrophiloides  
 Grevillea pinaster  
 Grevillea pinifolia P1  
 Grevillea polybotrya  
 Grevillea pterosperma  
 Grevillea pythara R  
 Grevillea rosieri P2  
 Grevillea sarissa subsp. sarissa  
 Grevillea shuttleworthiana subsp. shuttleworthiana  
 Grevillea tenuiloba P2  
 Grevillea teretifolia  
 Grevillea umbellulata subsp. acerosa  
 Grevillea umbellulata subsp. umbellulata  
 Grevillea uncinulata subsp. uncinulata  
 Grevillea yorkkrakinensis  
 Gunniopsis glabra  
 Gunniopsis intermedia  
 Gunniopsis quadrifida  
 Gunniopsis rubra P1  
 Gunniopsis septifraga  
 Gyrostemon racemiger  
 Gyrostemon ramulosus  
 Gyrostemon reticulatus X  
 Gyrostemon subnudus  
 Hakea erecta  
 Hakea francisiana  
 Hakea invaginata  
 Hakea minyma  
 Hakea preissii  
 Hakea recurva subsp. recurva  
 Hakea scoparia  
 Halgania cyanea  
 Halgania integerrima  
 Halgania lavandulacea  
 Halgania viscosa

*Halosarcia fimbriata*  
*Halosarcia halocnemoides*  
*Halosarcia halocnemoides* subsp. *caudata*  
*Halosarcia indica* subsp. *bidens*  
*Halosarcia lepidosperma*  
*Halosarcia leptoclada* subsp. *inclusa*  
*Halosarcia peltata*  
*Halosarcia pergranulata*  
*Halosarcia pergranulata* subsp. *pergranulata*  
*Halosarcia pruinosa*  
*Halosarcia pterygosperma* subsp. *pterygosperma*  
*Halosarcia syncarpa*  
*Halosarcia undulata*  
*Hedypnois rhagadioloides*  
*Hemiandra* aff. *pungens*  
*Hemiandra gardneri* R  
*Hemigenia dielsii*  
*Hemigenia diplanthera*  
*Hemigenia macphersonii*  
*Hemigenia* sp. Edah (J.W.Green 1601)  
*Hemigenia* sp. Jibberding (J.D'Alonzo 418)  
*Hemigenia* sp. Paynes Find (A.C.Beaglehole 49138)  
*Hemigenia westringioides*  
*Hemiphora elderi*  
*Hibbertia acerosa*  
*Hibbertia* aff. *crassifolia*  
*Hibbertia* aff. *gracilipes*  
*Hibbertia* aff. *recurvifolia*  
*Hibbertia arcuata*  
*Hibbertia drummondii*  
*Hibbertia exasperata*  
*Hibbertia glomerosa*  
*Hibbertia lividula*  
*Hibbertia nutans*  
*Hibbertia rostellata*  
*Hibbertia rupicola*  
*Homalocalyx aureus*  
*Homalocalyx coarctatus*  
*Homalocalyx thryptomenoides*  
*Hordeum glaucum*  
*Hyalochlamys globifera*  
*Hyalosperma demissum*  
*Hyalosperma glutinosum*  
*Hyalosperma glutinosum* subsp. *glutinosum*  
*Hyalosperma glutinosum* subsp. *venustum*  
*Hyalosperma zacchaeus*  
*Hybanthus epacroides*  
*Hybanthus floribundus*  
*Hybanthus floribundus* subsp. *floribundus*  
*Hydrocotyle callicarpa*  
*Hydrocotyle pilifera* var. *glabrata*  
*Hydrocotyle rugulosa*  
*Hypochaeris glabra*  
*Isoetes caroli*  
*Isoetes inflata*  
*Isoetes tripus*  
*Isoetopsis graminifolia*  
*Isopogon divergens*  
*Isopogon scabriusculus* subsp. *stenophyllus*  
*Isopogon scabriusculus* subsp. *stenophyllus* ms  
*Isotropis cuneifolia*  
*Isotropis drummondii*  
*Isotropis juncea*  
*Jacksonia acicularis* ms  
*Jacksonia arida* ms  
*Jacksonia fasciculata*  
*Jacksonia macrocalyx*  
*Jacksonia nematoclada*  
*Jacksonia rhadinoclada*  
*Jacksonia velutina* P4  
*Juncus aridicola*  
*Keraudrenia hermanniifolia*  
*Keraudrenia integrifolia*  
*Kunzea pulchella*  
*Lachnostachys coolgardiensis*  
*Lachnostachys eriobotrya*  
*Lachnostachys verbascifolia* var. *verbascifolia*  
*Lamarckia aurea*  
*Lawrencella davenportii*  
*Lawrencella rosea*  
*Lawrencia squamata*  
*Laxmannia paleacea*  
*Lechenaultia biloba*  
*Lechenaultia macrantha*  
*Lepidobolus preissianus* subsp. *volubilis* ms  
*Lepidosperma* aff. *resinosum*  
*Lepidosperma costale*  
*Lepidosperma resinosum*  
*Lepidosperma scabrum*  
*Lepidosperma squamatum*  
*Leptomeria preissiana*  
*Leptosema aphyllum* ms  
*Leptosema daviesioides*  
*Leptosema tomentosum* ms  
*Leptospermum roei*  
*Leucopogon cuneifolius*  
*Leucopogon gracillimus*  
*Leucopogon hamulosus*  
*Leucopogon nutans*  
*Leucopogon obtusatus*  
*Levenhookia leptantha*  
*Levenhookia pusilla*  
*Lobelia heterophylla*  
*Lobelia rarifolia*  
*Lobelia winfridae*  
*Logania flaviflora*  
*Lomandra micrantha* subsp. *teretifolia*  
*Lysinema ciliatum*  
*Lysinema ciliatum* forma Central  
wheatbelt (S.Paust 898)  
*Lysiosepalum rugosum*

Maireana aff. planifolia  
Maireana amoena  
Maireana atkinsiana  
Maireana brevifolia  
Maireana diffusa  
Maireana georgei  
Maireana marginata  
Maireana thesioides  
Maireana tomentosa subsp. tomentosa  
Malleostemon roseus  
Malleostemon tuberculatus  
Mallophora globiflora  
Mallophora rugosifolia  
Marsilea drummondii  
Medicago laciniata var. laciniata  
Melaleuca acerosa  
Melaleuca acuminata subsp. websteri ms  
Melaleuca adnata  
Melaleuca aff. concreta  
Melaleuca aff. nesophila  
Melaleuca conothamnoides  
Melaleuca cordata  
Melaleuca coronicarpa  
Melaleuca ctenoides  
Melaleuca eleuterostachya  
Melaleuca elliptica  
Melaleuca fulgens subsp. fulgens  
Melaleuca halmaturorum  
Melaleuca holosericea  
Melaleuca lateriflora subsp. lateriflora ms  
Melaleuca laxiflora  
Melaleuca leiocarpa  
Melaleuca leptospermoides  
Melaleuca macronychia subsp. macronychia  
Melaleuca nematophylla  
Melaleuca nematophylla ms  
Melaleuca nesophila  
Melaleuca oldfieldii  
Melaleuca orbicularis ms  
Melaleuca pauperiflora subsp. fastigiata  
Melaleuca platycalyx  
Melaleuca pungens  
Melaleuca radula  
Melaleuca scabra  
Melaleuca sclerophylla P3  
Melaleuca sp. Wongan Hills (R. Davis 1959)  
Melaleuca thyoides  
Melaleuca uncinata  
Melaleuca viminea subsp. viminea  
Mesembryanthemum crystallinum  
Mesomelaena graciliceps  
Mesomelaena preissii  
Microcybe multiflora subsp. multiflora  
Micromyrtus obovata  
Micromyrtus racemosa  
Micromyrtus racemosa var. carinata ms  
Micromyrtus racemosa var. latifolia ms P2  
Micromyrtus racemosa var. prochytes ms  
Microtis parviflora  
Millotia myosotidifolia  
Millotia perpusilla  
Millotia tenuifolia var. tenuifolia  
Mirbelia depressa  
Mirbelia floribunda  
Mirbelia microphylla  
Mirbelia ramulosa  
Mirbelia spinosa  
Mirbelia trichocalyx  
Monachather paradoxus  
Myriocephalus pygmaeus  
Nemcia obovata  
Nemcia spatulata  
Neurachne alopecuroidea  
Nicotiana rotundifolia  
Olearia dampieri subsp. eremicola ms  
Olearia humilis  
Olearia muelleri  
Olearia pimeleoides  
Olearia propinqua  
Opercularia spermacocea  
Ophioglossum lusitanicum  
Ornithogalum arabicum  
Osteospermum clandestinum  
Panicum antidotale  
Parietaria cardiostegia  
Patersonia drummondii subsp. borealis ms  
Pentzia globifera  
Persicaria prostrata  
Persoonia angustiflora  
Persoonia chapmaniana P2  
Persoonia quinquenervis  
Persoonia rufiflora  
Persoonia saundersiana  
Persoonia stricta  
Petalostylis cassioides  
Petrophile incurvata  
Petrophile seminuda  
Petrophile shuttleworthiana  
Petrophile wonganensis  
Phebalium ambiguum  
Phebalium brachycalyx P1  
Phebalium canaliculatum  
Phebalium megaphyllum ms  
Phebalium tuberculatum  
Phebalium tuberculatum subsp. aff. megaphyllum  
Phyllota luehmannii  
Pileanthus peduncularis  
Pimelea aeruginosa  
Pimelea angustifolia  
Pimelea avonensis  
Pimelea brevifolia subsp. modesta  
Pimelea brevistyla subsp. minor

*Pimelea forrestiana*  
*Pimelea imbricata* var. *piligera*  
*Pimelea sulphurea*  
*Pittosporum phylliraeoides* var. *microcarpa*  
*Pityrodia axillaris* P1  
*Pityrodia bartlingii*  
*Pityrodia halganiacea*  
*Pityrodia lepidota*  
*Pityrodia teckiana*  
*Pityrodia terminalis*  
*Plantago debilis*  
*Platysace maxwellii*  
*Platysace trachymenioides*  
*Plectrachne rigidissima*  
*Podolepis canescens*  
*Podolepis capillaris*  
*Podolepis kendallii*  
*Podolepis lessonii*  
*Podotheca angustifolia*  
*Podotheca chrysantha*  
*Podotheca gnaphalioides*  
*Podotheca uniseta* P2  
*Pogonolepis muelleriana*  
*Pogonolepis stricta*  
*Polypogon monspeliensis*  
*Prasophyllum cyphochilum*  
*Prasophyllum gracile*  
*Prasophyllum sargentii*  
*Prostanthera campbellii*  
*Prostanthera eckersleyana*  
*Prostanthera semiteres* subsp. *intricata*  
*Psammomoya choretroides*  
*Pseudanthus intricatus* ms  
*Ptilotus drummondii* var. *drummondii*  
*Ptilotus drummondii* var. *minor*  
*Ptilotus eriotrichus*  
*Ptilotus exaltatus* var. *exaltatus*  
*Ptilotus exaltatus* var. *villosus*  
*Ptilotus gaudichaudii* var. "unsorted"  
*Ptilotus gaudichaudii* var. *gaudichaudii*  
*Ptilotus holosericeus*  
*Ptilotus obovatus* var. "unsorted"  
*Ptilotus obovatus* var. *obovatus*  
*Ptilotus polystachyus*  
*Ptilotus polystachyus* var. *polystachyus*  
*Quinetia urvillei*  
*Radyera farragei*  
*Raphanus raphanistrum*  
*Regelia velutina*  
*Reseda lutea*  
*Rhagodia drummondii*  
*Rhagodia preissii* subsp. *preissii*  
*Rhodanthe chlorocephala* subsp. *rosea*  
*Rhodanthe chlorocephala* subsp. *splendida*  
*Rhodanthe citrina*  
*Rhodanthe heterantha*  
*Rhodanthe laevis*  
*Rhodanthe manglesii*  
*Rhodanthe maryonii*  
*Rhodanthe pygmaea*  
*Rhodanthe spicata*  
*Rhodanthe stricta*  
*Ricinocarpos velutinus*  
*Roycea divaricata*  
*Rulingia cuneata*  
*Rulingia densiflora*  
*Rulingia luteiflora*  
*Rumex drummondii* P4  
*Santalum acuminatum*  
*Santalum spicatum*  
*Sarcozona praecox*  
*Scaevola hamiltonii*  
*Scaevola humifusa*  
*Scaevola spinescens*  
*Schismus barbatus*  
*Schoenia cassiniana*  
*Schoenia filifolia* subsp. *filifolia*  
*Schoenus armeria*  
*Schoenus hexandrus*  
*Schoenus* sp. smooth culms (K.R. Newbey 7823)  
*Scholtzia drummondii*  
*Sclerolaena diacantha*  
*Sclerostegia disarticulata*  
*Sclerostegia moniliformis*  
*Senecio glossanthus*  
*Senecio lautus*  
*Senna cardiosperma* subsp. *flexuosa*  
*Senna cardiosperma* subsp. *stowardii*  
*Senna glutinosa* subsp. *charlesiana*  
*Senna pleurocarpa* var. *angustifolia*  
*Setaria verticillata*  
*Siloxerus multiflorus*  
*Siloxerus pygmaeus*  
*Sisymbrium irio*  
*Sisymbrium orientale*  
*Solanum elaeagnifolium*  
*Solanum hoplopetalum*  
*Solanum lasiophyllum*  
*Solanum nummularium*  
*Solanum oldfieldii*  
*Solanum orbiculatum* subsp. *orbiculatum*  
*Sonchus oleraceus*  
*Sonchus tenerrimus*  
*Spartothamnella puberula* P2  
*Spergula pentandra*  
*Spergularia rubra*  
*Spyridium majoranifolium*  
*Stackhousia monogyna*  
*Stenanthemum intricatum*  
*Stenanthemum pomaderroides*  
*Stenopetalum filifolium*  
*Stylidium adpressum*

*Stylidium breviscapum* var. *breviscapum*  
*Stylidium confluens*  
*Stylidium crassifolium*  
*Stylidium crassifolium* subsp. *elongatum*  
*Stylidium diuroides* subsp. *paucifoliatum* P2  
*Stylidium emarginatum* subsp. *emarginatum*  
*Stylidium leptophyllum*  
*Stylidium nungarinense*  
*Stylidium petiolare*  
*Stylidium udusicola*  
*Stylobasium australe*  
*Stypandra glauca*  
*Styphelia tenuiflora*  
*Swainsona beasleyana*  
*Swainsona colutooides*  
*Synaphea interioris*  
*Templetonia aculeata*  
*Templetonia sulcata*  
*Teucrium sessiliflorum*  
*Thelymitra antennifera*  
*Thelymitra campanulata*  
*Thelymitra nuda*  
*Thelymitra sargentii*  
*Thomasia tremandroides*  
*Thryptomene aspera* subsp. *Paynes*  
 Find(C.A.Gardner 11996)  
*Thryptomene australis*  
*Thryptomene cuspidata*  
*Thryptomene denticulata*  
*Thryptomene hyporhytis*  
*Thryptomene kochii*  
*Thryptomene mucronulata*  
*Thryptomene racemulosa*  
*Thyridolepis mitchelliana*  
*Thysanotus* aff. *patersonii*  
*Thysanotus manglesianus*  
*Thysanotus patersonii*  
*Thysanotus rectantherus*  
*Trachymene cyanopetala*  
*Trachymene ornata*  
*Trachymene pilosa*  
*Tragus australianus*  
*Trichanthodium skirrophorum*  
*Trifolium glomeratum*  
*Triglochin calcitrapum* subsp. *incurvum* ms  
*Triglochin mucronatum*  
*Triglochin stowardii* P2  
*Triodia rigidissima*  
*Trymalium daphnifolium*  
*Uldinia ceratocarpa*  
*Urodon capitatus*  
*Velleia cynopotamica*  
*Velleia discophora*  
*Velleia rosea*  
*Verreauxia reinwardtii*  
*Verticordia acerosa* var. *preissii*  
*Verticordia auriculata*  
*Verticordia brachypoda*  
*Verticordia chrysantha*  
*Verticordia chrysanthella*  
*Verticordia densiflora* var. *densiflora*  
*Verticordia endlicheriana* var. *manicula*  
*Verticordia eriocephala*  
*Verticordia grandis*  
*Verticordia halophila*  
*Verticordia helmsii*  
*Verticordia mitchelliana*  
*Verticordia monadelpha* var. *monadelpha*  
*Verticordia muelleriana* subsp. *muelleriana* P3  
*Verticordia nobilis*  
*Verticordia picta*  
*Verticordia plumosa* var. *brachyphylla*  
*Verticordia pritzelii*  
*Verticordia rennieana*  
*Verticordia roei* subsp. *meiogona* P1  
*Verticordia staminosa* subsp. *staminosa* R  
*Verticordia tumida* subsp. *tumida*  
*Verticordia venusta* P3  
*Vittadinia dissecta* var. *hirta*  
*Waitzia acuminata* var. *acuminata*  
*Waitzia nitida*  
*Westringia cephalantha*  
*Wrixonia prostantheroides*  
*Wurmbea drummondii* P4  
*Wurmbea tenella*  
 X *Drakodenia ornata* ms P1  
*Xanthorrhoea gracilis*  
*Xanthosia bungei*  
*Zygophyllum simile*